

# POWERLINE

The Voice of the On-Site Power Generating Industry



## On-Site Power:

The New Reality

## Residential On-Site Power

Growing Energy Needs  
Drive Residential Market

## Ride the Wave

EGSA Fall Conference Recap

## EGSA News

- *Niekamp Honored*
- *2008 EGSA Board*

## Growing Pains

The Increased Need for  
Generator Expertise





T H E

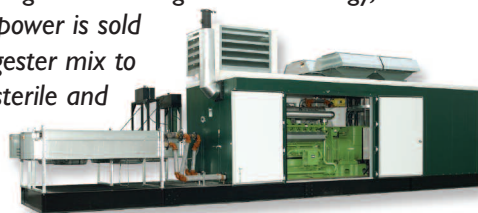
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EGSA Members "Ride the Waves of Change" at the 2007 Fall Conference; Page 15.



On the Cover: On-Site Power finds a place in the Home. Page 18.

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### Conferences

#### EGSA 2008 Annual Spring Convention

March 16-18, 2008; Santa Ana Pueblo, NM

The Association's Annual Convention of Members. Speakers will cover business and technical aspects of On-Site Power Generation and current industry trends. For additional information, visit [www.EGSA.org](http://www.EGSA.org) or call (561) 750-5575.

#### EGSA 2008 Fall Technical & Marketing Conference

September 7-9, 2008; Atlanta, GA

Speakers will cover business and technical aspects of On-Site Power Generation and current industry trends. For information, visit [www.EGSA.org](http://www.EGSA.org) or call (561) 750-5575.

### Schools

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\*To be held concurrently with POWER-GEN International

### Industry Trade Shows

#### POWER-GEN International 2007

December 11-13, 2007; New Orleans, LA

The world's biggest show for power generation, featuring the EGSA On-Site Power Pavilion. For exhibit information, contact EGSA at (561) 750-5575, ext. 205 or e-mail Jalane Kellough at [J.Kellough@EGSA.org](mailto:J.Kellough@EGSA.org).

#### Vietnam Electricity Expo 2007

December 5-7, 2007; Hanoi, Vietnam

Fully supported by the Vietnamese Ministry of Industry and Electricity and held in rotation with Hochiminh City since 1992, focusing on small to midsize thermo and hydroelectric projects. For information, visit [www.cpexhibition.com](http://www.cpexhibition.com).

#### POWER-GEN International 2008

December 2-4, 2008; Orlando, FL

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Look for more industry events in our up-to-date calendar on the web at [www.EGSA.org](http://www.EGSA.org). EGSA Members: To list your meetings here, fax your information to (561) 395-8557.

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*Powerline* is published six times per year on a bi-monthly basis. Articles and information submitted for publication should be forwarded to the attention of the Editor at the address above 30 days prior to publication. Technical articles and articles of general interest to the electrical generation industry are actively sought and encouraged. *Powerline* reserves the right to limit information appearing in its pages to that which, in its sole discretion, will reflect positively on EGSA and the industry which it serves.

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Gary Kidwell  
2007 EGSA President

## Image is Today, Reputation is Forever

The most valuable thing our customers buy from us is not our products and services. It's our companies' reputations. Not that our reputations are for sale. They're clearly not.

Customers buy what our reputations represent. Confidence. Trust. Peace of mind that we'll be around for all their tomorrows to support them. Quality products and services are table stakes to get into the power generation game. Reputation gives us the ability to win long term. So if it's that important, what makes for a good reputation?

Those who study company reputations say it's corporate social responsibility, ethical behavior and a well-respected chief executive officer. These are any successful company's MVAs, or most valuable assets. An MVA CEO is every bit as important to a company as MVP Alex Rodriguez is to the New York Yankees. Maybe even more so.

Companies that cultivate their MVAs produce a bumper crop of benefits. First, customers are likely to remain loyal. Loyal customers are easily more valuable than merely satisfied customers.

Companies can recruit more talented employees. Their products are less likely to suffer commoditization pressure. These benefits translate into the mother of all benefits—strong profits and stock price.

Good reputations also engender strong community support, an especially important benefit during difficult times.

Once a company establishes a strong reputation, it needs to maintain it by delivering quality products and service day after day. Every company has its own threshold for accomplishing this, but the reputation of Nordstrom's department stores is legendary.

What has become lore in the customer service space is a story of a lady who returned four tires that she had bought for her car. She was dissatisfied with them so demanded her money back. The Nordstrom representative dutifully returned the money. This may not sound like above-and-beyond customer service, but when you consider that Nordstrom's didn't sell tires, it's pretty incredible. That's WOW! customer service.

A current TV ad campaign by Federal Express shows how employees go above and beyond the call of duty to deliver packages in especially difficult situations. That's good customer service and it's also good reputation management.

Another way to manage a company's reputation is to monitor what people are thinking about the company. This includes customers, employees and stockholders, obviously.

But there are others who should be paid close attention. They're local communities, government and the media. No other group can affect a company's reputation as broadly and as quickly as the media. They deserve special care.

Earlier I mentioned ethical behavior as one of the underpinnings of a strong reputation. If there's a single determinant of a strong reputation, this is it.

Employees must live, breathe and stand by the company's ethics policy and vision. Like Nordstrom's, the company should encourage lore, or storytelling. It's sharing examples of employees doing the right thing, especially when doing something else would have been much easier. This sets the example, the benchmark if you will, for all employees. The employee leading this parade ought to be the CEO.

The second underpinning, social responsibility, reaches beyond a company being a responsible citizen. It's also employees volunteering for community and professional service. Participating in 5K runs and walks and helping with food drives are a few of the community activities to which employees can contribute their time.

Professionally, EGSA members who serve on the Board and other volunteer positions set examples for others to give their time to help advance the electrical generation industry.

Building a strong reputation takes commitment. Keeping it that way takes relentless commitment. It requires total abstention of big-headedness. Cockiness can be a quick route to a damaged reputation.

Since no company is perfect, identifying internal weaknesses as they occur becomes a strength. Listening to stakeholders, especially customers, is a good way to isolate what's gone wrong. If a company can keep out of its own way and pay attention, it has a better than even chance of maintaining what it took so long to build.

When it comes to reputation, President and General George Washington said it best more than two centuries ago... "Associate yourself with men of good quality if you esteem your own reputation; for 'tis better to be alone than in bad company." ■



*George Rowley  
EGSA Director  
of Education*

## Certification Program Update

The EGSA Generator Technician Certification Program continues to gain momentum as more and more techs and their employers recognize its many marketing and career development advantages and benefits. 389 Study Guides have been distributed to techs preparing to take the test. There are now 104 Certified Technicians (7 are Canadian), including the 13 techs that passed the test in September (this is the second highest volume on record; 14 passed the test in May). The visibility of Certified Technicians is increasing as well; we have distributed 250 logo items (uniform patches, ball caps, and decals). Only EGSA Certified Technicians can use the logo items that prominently feature our gen-set logo. Are you and your technicians displaying the patch?

### **Presenting our new Two-Tiered School**

As mentioned previously, we are very excited about changes to the school that will debut next year. Beginning in 2008, we will offer 3-day "Basic" Schools and 4-day "Advanced" Schools. The new curriculum is designed to better meet the needs and diverse backgrounds of those who attend our schools.

We have "lightened up" several modules for the Basic School and "beefed up" those same modules for the Advanced School. "Starting Systems," "Emissions," and "Noise Control" modules have been added in the Advanced school. In addition, we have eliminated Optional Seminars and incorporated them into the appropriate Basic or Advanced School curriculum.

The Basic School is a general—yet technical—overview of On-Site Power Generation equipment whereas the Advanced school will offer more highly technical and in-depth coverage of the equipment. The Basic School is designed for those in non-technical positions (such as Sales or Mar-

keting, Administrative, or Management positions) and for those with less than three years' experience working in the industry. The Advanced School is designed for those who have attended the EGSA Basic On-Site Power Generation School; those employed in Engineering, Project Management, or Service positions; and for those with over three years' experience in the industry.

Detailed information about our new schools, including the module descriptions and learning outcomes will be available soon.

### **Instructor Enhancement Program**

While our instructors have consistently received high ratings from students for their knowledge and teaching skills, all continue to strive to improve their presentations. To further enhance their presentation skills and student learning, the instructors will soon engage in a series of webinars in which they will learn more about the unique needs of adult learners and more about the intricacies of providing an excellent presentation. To further facilitate this process, we will tape segments of each instructor's presentations and forward them to a consultant who will review each segment and provide feedback and suggestions (where appropriate) for improvement. Our consultant, Bill Heacock of Heacock, Perez, and Associates will facilitate the entire process. Once again, we thank the EGSA Board of Directors for their support and their investment in our schools and instructor development.

If you have comments or questions about our school or any EGSA education-related program, please contact George Rowley, EGSA Director of Education. George's e-mail address is [G.Rowley@EGSA.org](mailto:G.Rowley@EGSA.org) or he can be reached by phone at 562-237-5557. ■





# Techs Stand Apart from the Competition with the EGSA Certified Electrical Generator Systems Technician logo

Do you or your techs use this patch? This is the patch used only by EGSA Certified Technicians. It sends a clear message that the tech and the employer are special. The tech has proven skill and knowledge through passing a rigorous test; The employer is committed to excellence and high standards. Techs who have earned the title "EGSA Certified Electrical Generator Systems Technician"—use the logo with pride!



| EGSA Member Item # (Specify)     | Non-Member Item # (Specify)      | Quantity | Logo Item Description   | EGSA Member? (Specify)        | Non-Member? (Specify)         | Item Total |
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| <input type="checkbox"/> FSU 093 | <input type="checkbox"/> FSU 094 |          | <b>Logo Uniform Patch</b> —These highly detailed uniform patches contain over 15,000 stitches to highlight our copyrighted line drawing genset logo and proclaims, in gold lettering, that the wearer is an "EGSA Certified Electrical Generator Systems Technician."   | <input type="checkbox"/> \$3  | <input type="checkbox"/> \$6  |            |
| <input type="checkbox"/> FSU 120 | <input type="checkbox"/> FSU 121 |          | <b>Baseball Cap</b> —These distinctive EGSA blue caps with white brim stripe, button, and vents feature the EGSA Certified Electrical Generator Systems Technician logo in front. These one-size-fits all caps are made of durable high-quality cotton and feature a flex-strap to adjust the size.               | <input type="checkbox"/> \$20 | <input type="checkbox"/> \$25 |            |
| <input type="checkbox"/> FSU 122 | <input type="checkbox"/> FSU 123 |          | <b>Self-Adhesive Decal (4"x6")</b> —These heavy-duty adhesive-backed vinyl decals are made to hold up to exposure to the elements. To help resist fading and weathering, the images are printed with UV-resistant ink and we have applied an extra coating to further protect the image from fading and abrasion. | <input type="checkbox"/> \$10 | <input type="checkbox"/> \$15 |            |
| <input type="checkbox"/> FSU 124 | <input type="checkbox"/> FSU 125 |          | <b>Self-Adhesive Decal (8"x10")</b>   | <input type="checkbox"/> \$20 | <input type="checkbox"/> \$25 |            |

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Herb Whittall  
EGSA Technical Advisor

# IEC Calls for Proposal Comments

The International Electrotechnical Commission (IEC) has submitted a couple of proposals for comments. One is a new work item with the title: "Analysis Techniques for Dependability—Petri Net Modeling." Apparently, Mr. Petri is well known in certain circles for his treatise concerning this subject. To me it looked like a modification of a flow diagram which we all have used at one time or another. I voted to continue the work on this new work item proposal just to see where it will go.

The second item was a Committee Draft (CD) titled: IEC 60050-191 Ed 2.0: *International Electrotechnical Vocabulary—Part 191: Dependability*. For some reason, the authors of this document seem to think they need to have different definitions and different names for whether an item is repairable or non-repairable. For example: 191-45-08 reads: "Constant failure intensity period—Period in the life of a repairable item during which the failure intensity is approximately constant." Meanwhile 191-45-09 reads: "Constant failure rate period—Period in the life of a non-repairable item during which the failure rate is approximately constant." As you can see, the only difference between the two is that *repairable* items have *failure intensity* while *non-repairable* items have *failure rates*. This goes on throughout the document so that the only difference between 191-45-13 Mean Failure Rate and 191-45-15 Mean Failure Intensity is that 13 refers to non-repairable items and 15 refers to repairable items. I therefore wrote in my comments that the document was too complicated and too wordy, and therefore I voted against its adoption.

The August issue of *Building Safety* from the International Code Council (ICC) focused on "green buildings" and all the ICC is doing to try and promote them. The magazine also detailed the changes made to the International Fire Code at the last annual meeting, but I did not see anything that

will help EGSA members with the problems of breather tubes and fill points on enclosed generator sets with sub-base fuel tanks.

The subject of Arc Flash Studies and protection has been at the forefront recently, especially with the update of NFPA 70 E *Standard for Electrical Safety in the Workplace*. The August issue of the *NEC Digest* has an article "How to perform an Arc Flash Study in 12 Steps" by Jim Phillips, P.E. It is the first of three articles on the subject by him that will cover the 12 steps. He refers in the article to IEEE 1584a-2004 *Guide for Performing Arc-Flash Hazard Calculations*. The September/October *IEEE Industry Applications Magazine* has an article starting titled "Meeting The Standards" with the subtitle "Testing and certification of medium-voltage control centers to arc-resistant standards." If you are in this section of the industry, I recommend you peruse these two articles and the two follow-up articles by Jim Phillips.

NFPA is offering two seminars concerning NFPA 70E *Electrical Safety in the Workplace*. The seminar will be a full day (8 a.m. to 4:30 p.m.). The seminars will be held: December 3 at the Hyatt Regency in St. Louis, Tel 314-231-1234; and December 10 at the International Plaza Resort in Orlando, Tel 407-352-1100.

The seminar costs \$385 (\$345 to NFPA members). For more information and registration, call NFPA at 1-800-344-3555 or register on line at [www.nfpalearn.org](http://www.nfpalearn.org). Don't forget to mention priority code GF-BBB-1Z.

I hope you all attended the Fall EGSA Convention and found it to be very educational and worthwhile. Both the interpersonal conversations and the subject matter of the presentations make these conferences worth every On-Site Power professional's time. ■

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## Ken Niekamp Recognized for Service to the On-Site Power Industry

Ken Niekamp, retired from Chillicothe Metal Co., Inc. of Chillicothe, IL was singled out at the recent Electrical Generating Systems Association (EGSA) Fall Conference in Maui, HI, and recognized for his service to EGSA and the entire On-Site Power industry.

2007 EGSA President Gary Kidwell, ASCO Power Technologies, presented Mr. Niekamp with the Gordon Johnson Lifetime Achievement Award. Established in 1994, The Gordon Johnson Award is given on an as-needed basis to honor an individual who has devoted his career to the

betterment of the Association and the industry. This "Member Emeritus" award is only given to such individuals who have retired from the industry, but whom the Association feels deserve the title of "member for life." The award is named in honor of—and was first given to—Past EGSA President Gordon Johnson, whose name has become synonymous with EGSA.





Mr. Niekamp served on the Board of Directors from 1997 to 1999 and again as a fill-in director from 1999 to 2000. He has served on the Membership Committee for at least 20 years holding various offices on

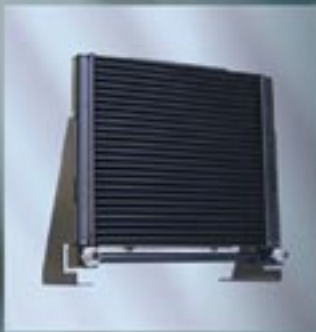


2007 EGSA President Gary Kidwell (left) presents Ken Niekamp, formerly of Chillicothe Metal Co., Inc. of Chillicothe, IL (right) with the Gordon Johnson Lifetime Achievement Award as his wife, Judy Niekamp (center), looks on.

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that committee. He has been a contributing author for the *On-Site Power Generation Reference Book* for several editions. He also represented EGSA on the PennWell education program committee for Power-Gen, and in 2003 he received the Leroy Carpenter Award.

Nearly 250 On-Site Power professionals attended the Convention, one of the highest numbers of attendees in recent years. EGSA is an international trade association made up of over 500 companies throughout the United States and a dozen other countries. Headquartered in Boca Raton, FL, it is the world's largest organization dedicated to On-Site Power generation. For more information about the Association, visit [www.EGSA.org](http://www.EGSA.org).



## EGSA Elects New Officers and Board Members for 2008

The Electrical Generating Systems Association (EGSA) announced its 2008 Officers and Board of Directors, effective January 1. They were announced at the association's recent convention in Maui, Hawaii. Warner Bauer, Kickham Boiler & Engineering, Inc. Vaporphase Div., St. Louis, MO, will serve as EGSA's 2008 President. He was the association's President-Elect in 2007 and Vice-President in 2006.

Greg Linton, JRS Custom Fabrication, Inc., Ocala, FL, will serve as EGSA's President-Elect. Ron Hartzel, Eaton Electrical, Pittsburgh, PA is Vice-President. John Kelly Jr., Kelly Generator & Equipment, Inc., Owings, MD, will serve as Secretary/Treasurer, and Gary Kidwell, ASCO Power Technologies, Lodi, CA, will serve as the Association's Immediate Past President.

For more information, visit EGSA online at [www.EGSA.org](http://www.EGSA.org).

## EGSA 2008 Board of Directors

- Vaughn Beasley, Ring Power Corporation, St. Augustine, FL
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- Charles Habic, Gillette Generators, Inc., Elkhart, IN
- Joe Hafich, Emergency Systems Service Company, Quakertown, PA
- Debra Laurents, Cummins Power Generation, Minneapolis, MN
- Bobby McDonald, Generator Service Co., Inc., Hueytown, AL
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# EGSA Rides "The Waves of Change"



2007 EGSA President Gary Kidwell (at podium) opened the 2007 Fall Technical & Marketing Conference by announcing EGSA has launched a new two-tiered On-Site Power School.

The Electrical Generating Systems Association (EGSA) recently held its 2007 Fall Technical & Marketing Conference at the Grand Wailea Resort Hotel & Spa in Maui, HI, September 16-18, 2007. Conference speakers and their topics were designed to be of interest to virtually every member of the On-Site Power Industry. Educational presentations included:

In his opening keynote address, "Yield to New Ideas," James B. Lloyd, President and Owner of 9 Screens International challenged attendees to find the positives with change. Whether it is a corporate merger, corporate restructuring, or downsizing; finding the positives in change will create a business environment of growth and loyalty, said Lloyd. He went on to relate several personal anecdotes to illustrate his points, including an encounter with an impressive display of customer service.

Speaker John Deane of KTR Associates Engineering Solutions provided attendees with the latest information on compliance requirements to meet NFPA 70E in his presentation, "NFPA 70E Electrical Safety Requirements in the Workplace." Deane's de-

tailed presentation gave attendees a better understanding of NFPA 70E and NFPA's efforts to raise the awareness of Electrical Hazards and outlined what manufacturers and distributor/dealers must do to become "70E" compliant.

In his luncheon keynote address, Wally Amos, founder of Famous Amos Cookies, charmed his audience with stories of his childhood, up through his days in the entertainment business, to the creation and loss of "Famous Amos" cookies.

In "Asia's Impact on North American Manufacturers," Stephen LeGrand urged his audience to look beneath the surface when it comes to competing with overseas manufacturers. Trans-ocean shipping, LeGrand pointed out, gives Asian manufacturers a distinct disadvantage when it comes to bringing product to the U.S. market in a timely fashion. Asia's advantages should, LeGrand argued, be limited to the cost of labor because U.S. manufacturers "can get the materials just as cheap."

"We have the relationships in our markets," added LeGrand. "We can subcontract high labor cost subassemblies as well.

The U.S. is a saturated market. Plus, it's a big ocean, freight is expensive and inventory is not cheap."

In "The State of the On-Site Power Market," Ray Kacvinsky, Vice President-Power Generation, Marathon Electric Mfg. Corp., reviewed EGSA generator statistics from 2000 through the first part of 2006 and compared EGSA market data against other industry information using an economic early warning technique with the data to develop a near-future On-Site Power market outlook. (*Editor's Note: see Mr. Kacvinsky's article of the same name in this issue.*)

In his presentation "Current Health of the Large Engine Industry—2007 Statistics," Mark McNeely, Publisher and Editor, Diesel and Gas Turbine Publications, gave attendees some insight into the *Diesel & Gas Turbine Worldwide* annual Power Generation Order Survey. The 30-year-old survey encompasses all piston and gas turbine engine orders for power generation applications 500 kilowatts and above. The presentation analyzed this year's survey figures, including which engine ranges saw increased orders, or decreased in volume.





It also broke out various engine order trends by type of fuel, type of service and geographic location.

In "Data Centers....uh oh...Here Come the High Nines Again!" Don Blackman, V.P. Marketing & Domestic Sales, ASCO / Power Switching & Controls, entertained his audience with an offbeat presentation that reviewed the growing demand for Data Storage and what's driving it. Data Center Facility expansion and new construction, said Blackman, are expected to grow significantly in the next four to six years. Data Centers can range in size from very small Tier-I types all the way up to huge buildings in a Tier-IV configuration. The greater the uptime expectation, the more backup power and control is required.

Attendees were eager to hear the latest from Todd Lathrop, Senior Design Engineer, Eaton Corp. in his presentation



"Residential Standby Power: The Future of On-Site Power in the Home." The demand for electricity in the residential sector, said Lathrop, continues to increase as more power-hungry devices are being added to the home environment. As the power grid continues to become more decayed and overloaded and the frequency of storm-related power outages continue to increase, the reliability of electrical power to the home becomes less. For these reasons, Lathrop argued, pad-mounted standby generators are quickly becoming the air-conditioners of yesteryear. *(Editor's Note: see Mr. Lathrop's article of the same name in this issue.)*

### EGSA Manufacturers Forum

In addition to the lineup of educational sessions, the conference included EGSA's highly successful Manufacturers Forum.

The exhibition setting allows EGSA-member manufacturers, attending Distributor/Dealers and manufacturer representatives to engage in a more formal dialogue.

The Electrical Generating Systems Association is an international trade association made up of over 500 companies throughout the United States and around the world that make, sell, and distribute On-Site Power generation and related equipment. Headquartered in Boca Raton, FL, EGSA is the world's largest organization dedicated to On-Site Power generation. The Association's 2008 Spring Convention will be held March 16-18 in Santa Ana Pueblo, NM. Details will be posted after the first of the year online at [www.EGSA.org](http://www.EGSA.org). ■



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# On-Site Power in the Home

*By Todd Lathrop, Senior Design Engineer, Eaton Corp.*





Simply put, the residential stationary generator is quickly becoming the central air conditioner of yesteryear. Decreases in cost and size, increased reliability of the generator systems coupled with the increased frequency and length of power outages, and the fact that we have a difficult time living without power all have made stationary generators more attractive to the average American homeowner.

There are several different causes of power outages in the residential market. At anytime, these outages can cause a homeowner discomfort, loss of consumables, income, property, and out of pocket expenses for restaurants or hotels/motels. A study by the Department of Energy, in 2004, found that the annual cost of power outages was \$79 billion dollars. \$2 billion of the \$79 billion was in the residential sector. Increases in the number of home business, etc. will cause that number to climb.

According to the Edison Electrical Institute, 70% of all power outages are weather related. Lightning can strike electrical equipment directly or strike trees that can come in contact with or fall onto power lines. Wind can cause outages by forcing trees or other items to come in contact with power lines. Extreme winds can cause the power lines or poles themselves to fail. Ice storms create a build up of heavy ice on power lines and tree limbs which can cause the power lines to break or fall to the ground. Interruption of power due to flooding or heavy rain can also occur. Both above ground and underground electrical equipment are susceptible. The utility may need to shut down subjected equipment therefore interrupting power to the home.

Animals create 11% of all power outages. Birds, squirrels, etc use power distribution equipment for warmth and for nesting. They also use the lines as a form of highway system. Unfortunately, there are times when these animals become the path of least resistance and short out phase wires, causing power outages.

The remaining 19% of outages where caused by motor vehicle accidents, planned outages, system overloading, and human error. Most power poles are located next

to our roadway systems and are subject to damage if hit by a motor vehicle. It is sometimes necessary to perform maintenance on distribution equipment or power lines which may require shutting down the equipment before service can be performed. Construction or other activities close to power lines can create an outage if the lines are touched, severed, etc. Extreme cold or hot weather may create high load requirements, leading to brown outs or black outs on the system.

Several large extended power outages have occurred in the past few years that have created loss of power to the home for periods of time that can extend beyond a week. Many of these outages, such as the northeast blackout of 2003 affect millions of people.

It is a well known fact that Americans today love their creature comforts. Air conditioning is one of the largest "must haves" in new homes. According to the National Association of Home Builders, 89% of new home construction in 2006 included central air conditioning. 76% of homes built in the Northeast in 2006 included central air. The 2006 Builder Insights (Parks Associates) says that 80% of builders offer security systems and install them in 66% of the homes that they build. 70% of builders offer multi room audio systems and are installing them in 50% of their buildings. 50% of builders offer Audio/Video for home theaters and install them in 46% of their buildings.

As technology in the home increases, the need for power also increases. VoIP (Voice over Internet Protocol) is becoming a popular alternative to the standard telephone in the home. Companies such as Vonage, Verizon Voicewing, and others are providing telephone service via the internet. Unlike standard wall telephones that receive "phantom" power from the phone wall jack, VoIP requires utility power in order to function. Nearly 75% of Americans own a computer and have access to the internet. Computers require power. CEDIA (Custom Electronic Design and Installation Association) indicates that 32% of all homes have home theaters installed.

As our population continues to age,

more and more Americans require some sort of medical equipment in the home. Oxygen tanks, heart monitors, etc require that power be available at all time. A week-long outage would be detrimental to those homeowners.

What is important to the customer? First and foremost it is price. Frost and Sullivan indicate that price is the most important factor for a customer to purchase a residential generator or back up power. Quality, reliability, availability, technology, and specialization complete the list. If a generator is installed in a new building, the cost of the back up power is rolled into the mortgage and the customer does not really see the cost. If a generator is installed after the fact, the homeowner will have to pay out of pocket and may be more reluctant to purchase the back up power system.

There are many reasons to have back-up power in the home; however, what we do not realize is how often we really are without power. According to the Electrical Power Research Institute, an estimated 15 million people were without power in 2005. The average home is without power three to four times per year! Americans are using more power in the home in spite of the fact that more and more Energy Star appliances are installed in the home. The cost of energy has not deterred the use of electricity in the home. In seven years, from 1999 to 2006, we increased our consumption of electricity in the home by 344.6 Billion KWH. A fragile power grid is becoming more unreliable as we continue to add more loads to it. Lack of upgrades to the grid is causing surges, spikes, sags, etc. that lead to power outages.

Changes to Article 702, Optional Stand-by Systems, in the 2008 National Electric Code (NFPA 70) will dictate that when used with an automatic transfer switch 1) the generator must be sized to handle the entire load, or 2) an active load management system must be employed to ensure that the generator does not become overloaded. This change in the code will create more of a need for the 30-45kW sized generators in the Residential market.

Alternatives to residential generators are gaining ground and meet the require-

ments for renewable power. Solar, Wind, and Hydro units for the home exist and are growing in revenue. Solar is leading the way with an estimated market of \$424.2 million in 2007. New manufacturing methods are being developed that are lowering the cost of PV's. This alone is bringing the price down to a level that is becoming more acceptable to the general public. Solar power can be used with or without on site storage (batteries) and can also be used to supplement utility power. It can also be used to feed back into the utility grid via net metering. This type of metering captures the net energy usage by the customer versus the amount of power fed back into the grid.

Wind power is the fastest growing of the renewable energy sources. The American Wind Energy Association (AWEA) published a 2007 study that indicates that 17.5 MW of installed capacity was added in 2006 (approx. 6800 units). The growth rate, according to (AWEA) is in the range of 14-25% even though it is the only main-

stream renewable energy source without a 30% federal investment tax credit. AWEA believe that the growth rate could top the 40% rate if the tax credit were available to wind power.

Hydro generation is available for the

**According to the Electrical Power Research Institute, an estimated 15 million people were without power in 2005. The average home is without power three to four times per year!**

home use, however, is not practical in most cases. The Pelton Wheel works well in locations with high head pressure and low flow. A reservoir would be an example of this type of flow. Submersible propellers require a fast moving supply of water to

produce power. Typically, a stream that is at least 1 foot deep with a sustained water flow of, at least, 6 to 9 mph is required.

Other technology, such as fuel cells and micro turbines can be used in the residential market; however, initial cost per KW is prohibitive.

People today do not and cannot live without power to their homes. The increase in frequency of bad weather systems coupled with an aging grid is prohibiting this type of lifestyle. This creates a market for an alternate supply of power other than the utility power grid. As our infatuation with power-hungry devices grows, so does our need for some form of on-site home power generation. Soon enough, most homes will have standby generators or some other form of on site electrical power source. ■

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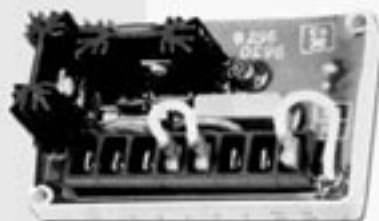
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# The New Reality for High Reliability and Extended Run Time

by Louis Braquet, PE, CEM

*Author's note: For the purpose of this article, the term "On-Site Power" will refer to all forms of On-Site Power Generation installed to replace or supplement utility grid power as might be associated with emergency, standby, auxiliary, or optional power, and would include any non-utility power supply operated to comply with codes, standards, insurance, business, or process needs at a site. In addition, the term "extreme (event) conditions" designates all natural and man-made events that would have both catastrophic and large geographic region impacts.*

While a few facilities may purchase more expensive equipment and operate more reliable systems than others, the concept of sustaining required operations (as opposed to basic, critically essential operations) for an extended period has not been typically addressed. That said, most facilities still manage their emergency power systems similar to the plans of the 1960s, utilizing minimally sized (to meet code or insurance basics), inexpensive diesel gen-sets rated at "standby or peaking" duty. These gen-sets are generally replaced only when they become so old that spare parts are no longer available! It is typical

for these systems to deploy a single, 20+ years old gen-set with a fuel "day tank", and interconnect via open transition switchgear that doesn't readily allow for regular testing under actual site load conditions. While this approach may suffice for non-critical power supplies, modern conditions dictate an extensive reconsideration of the criteria and options impacting these systems.

Depending on the exact nature of a regional catastrophic event, whether natural (i.e. flooding, storms, fires, earthquakes, etc.), man-made (i.e. terrorist, war, insurgency, industrial or transportation accident, etc.), or bio-environmental (epidem-

ic/pandemic, quarantine/regional isolation, contamination, etc.) there is the distinct potential that utility power systems will fail, that delivery of bulk fuel may be restricted, and that the option to evacuate the area may not be possible.

To address ultimate reliability and extended operation of an On-Site Power system, the approach presented in this paper will consider the deployment of a multiple gen-set scheme utilizing sufficient fuel storage and/or multiple fuel options, and interconnected to the site via paralleling, soft loading (with optional load shed) switchgear to allow

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### regular, full system testing under normal site load conditions.

Obviously, the approach presented here will not be acceptable to many sites because of complexity, size limitations or cost factors. Smaller, less critical On-Site Power systems may not find this type of system appropriate for their needs, but they should at least consider the issues presented in this paper to ensure that they make the right choice for their situation.

### Disclaimer

It is critically important to point out that, depending on a site's specific operations, certain codes, standards, insurance requirements, process and safety issues, etc. could take precedence and mandate specific On-Site Power system configurations that require a different approach than that presented in this paper.

### The New Reality for On-Site Power Systems

By way of introduction, it should be pointed out that up until only a few years ago, the position presented in this paper would have likely been considered far fetched or perhaps completely lacking a basis in reality. Recent awareness to changes in the global environment we live in has forced everyone to accept a new set of reality measures that "could" affect our lives. At risk of using a cliché, "Toto, I don't think we're in Kansas anymore!"

The old premise that electric power is a

luxury with which we can live without is no longer a reality in our modern society. With the recent power disruptions associated with utility grid failures (i.e. regional blackouts) and natural disasters, it has become only too clear just how dependent we are on a reliable power supply. If we then add to our list the very real potential for terrorist events and bio-environmental contamination (i.e. industrial accidents, industrial chemical accidents, pandemic/medical events, etc.), the harsh reality of

**The new reality is that a regional, long-term power outage would have catastrophic impacts on personal safety, property damage, and likely result in extensive suffering and loss of life.**

an extended regional power loss becomes all too real. Reliable electric power is no longer a luxury. It's a critical necessity for our existence, and extended power outages can have fatal consequences.

The new reality is that a regional, long-term power outage would have catastrophic impacts on personal safety, property damage, and likely result in extensive suffering and loss of life. We were allowed a

small glimpse of this unfortunate condition on a small scale just after hurricane Katrina destroyed power systems along the Gulf Coast in 2005. The storm and associated flooding contributed to electrical power outages that lasted many days and even months in some affected areas. Hospital services, evacuations, and rescue attempts were all but paralyzed while civil unrest unfolded in the powerless aftermath.

Another hard-learned lesson of the 2005 hurricanes was that merely maintaining critical services is no longer sufficient during extreme temperature and disaster conditions that last for many days. Extreme indoor temperatures, loss of facility water and sewage systems and no food refrigeration presented fatal issues that a reliable power supply would have addressed. New economic and legal liabilities associated with not being prepared have surfaced. Wrongful death lawsuits can be extremely costly. As a result, codes and standards are being rewritten, in most cases requiring extensive upgrades to designs that were deemed sufficient just a few years ago.

As we move into the future with the knowledge of the recent past, it is not difficult to imagine a similar but much worse scenario resulting from a terrorist or bio-environmental event that could encompass a much larger region and last significantly longer than a hurricane, earthquake, or flood. Regional isolation because of contamination, massive destruction, or quarantine could last weeks, and these

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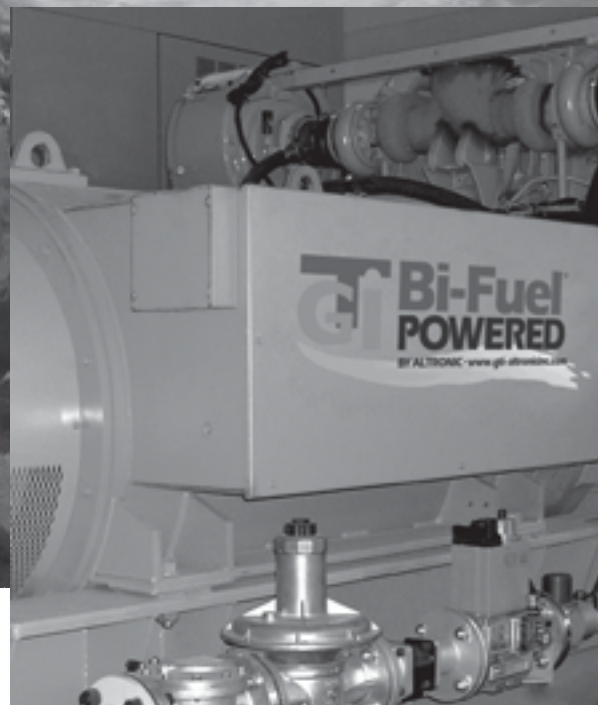
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conditions would make evacuations and providing basic services in the affected region impossible.

The more important issue here is that we have never experienced a widespread, long duration power failure in a modern society, one that could most likely be caused by a man-made event. Previously, power outages were considered in terms of hours. Katrina forced us to consider the potential for weeks. A terrorist, biomedical or military event could easily push this horizon into multiple weeks or longer. Mass evacuation of facilities and populations in large regions under quarantine or isolation would likely not be an option for various reasons.

Most of the On-Site Power systems in current operation are based on the same concepts established back in the 1960s, providing minimal power for only top-tier critical services for a short-term (i.e. multi-

Most of the On-Site Power systems in current operation are based on the same concepts established back in the 1960s, providing minimal power for only top-tier critical services for a short-term loss of utility power.

hour up to a couple days) loss of utility power. Typically, this power is provided for safe exit, safe shut down, or life critical circuits such as exit lights, elevators, hospital operating room services, fire pumps, etc. Stored fuel supply (i.e. diesel) for these gen-sets is typically enough for a couple of days' operation at best and, in many cases where not specifically required by code, perhaps enough for only a few hours of full run time.

It is interesting that some of the most reliable On-Site Power systems are installed on communication and data center equipment as well as industries where short duration power failures can be quite costly, such as critical manufacturing process, financial/data centers, and even the less obvious casino industry. By contrast, police and military installations, emergency operations centers, grocery stores, and gas

stations typically have limited, if any, long duration On-Site Power supply, although they would represent some of the most critical needs during an extreme event! Even hospitals—where On-Site Power has been deemed a fatal necessity—typically do not have sufficient On-Site Power supply to operate the entire facility for an extended duration.

While each project will have its own specific circumstances to consider, the minimally sized, simple standby diesel systems of the past will most likely prove inadequate during an extreme event, as was made unfortunately evident in New Orleans recently. This paper presents a more comprehensive approach for consideration when planning or upgrading an On-Site Power system to meet the challenges of this new reality environment.

### On-Site Power Key Parameters

The following criteria should be considered for optimizing reliability and extended run time of an On-Site Power scheme:

- **An accurate On-Site Power load analysis** to accommodate maximum anticipated loadings, including adequate consideration (i.e. additional capacity, “beefed up” alternator, etc.) for hard starting loads with sufficient added margin for new site load additions in the future.
- **Gen-sets sized to accurately accommodate the maximum load** as well as the load starting conditions using the manufacturer's continuous duty ratings as opposed to standby or peak duty ratings.
- **Deployment of a multiple gen-set scheme** to accommodate the site's power loads with a minimum of N+1 configuration (i.e. at least one spare gen-set) to allow for a down engine or mechanical failure during an event and allow for ongoing maintenance during an extended event. The N+1 calculation should be performed using maximum loading conditions anticipated at the site, which should allow for additional “spare capacity” when the facility is operating under reduced loads or when conditions might require an intentional reduction of power loads to keep only critical circuits (i.e. mission critical loads) in continuous operation.
- **Gen-set fuel selection and supply consideration** is absolutely critical for operating capability during an extended event. The old 1950's default option to automatically install diesel-fueled engines may not make sense during an extended runtime situation, especially at a larger power site where huge fuel storage volumes might be required. Site storage volume and impacting issues should be balanced against multiple fuel options and contingent fuel supply availability.
- **Proper switchgear and controls**, deploying utility paralleling (synchronous) switchgear with multiple gen-set, load-sharing control that allows regular, full On-Site Power system testing under actual site load conditions. For most locations, a “soft loading” control scheme will be advantageous to allow site gen-sets to pick up and accept operational load from the utility without fear of tripping under loading sequence. Ideally, this scheme should include downstream isolation switchgear (manual and/or automatic) to isolate (i.e. selectively disconnect) non-essential loads that can be shed during a hard start-up situation or when On-Site Power capacity is not able to maintain maximum output for whatever reason (i.e. gen-set failure, fuel shortages, etc.). This load-shed scheme can be automatically controlled by the paralleling main gear or via a separate (automatic or manual) control.
- **Regular testing and proper maintenance** for the On-Site Power system including engines, generator, cooling systems, fuel supply system, switchgear network, etc. that allows for safe, routine testing under fully loaded site conditions and meets all requirements



for maximum availability (codes, standards, manufacturer's specs, etc.). Weekly short duration testing along with monthly extended testing should be considered as a minimum.

Making sure all critical equipment is secure from external impacts (i.e. flooding, high winds, lightening, physical impacts, etc.) and accessible during emergency events is absolutely essential and must be addressed accordingly.

- **Stored supply of typical spare parts and consumables** should be managed at the site to ensure maintenance needs during an extended event. Obviously, the training and capability of site personnel to perform these duties during an extreme event would be required.

## Basic Switchgear and Control Considerations

The method of electrical interconnection and control of the On-Site Power systems is every bit as critical as the gen-set and fuel selection criteria. In fact, the

limitations that certain gear and controls impose are often overlooked in the overall plan, and a simple open or closed transfer switch is typically specified. While an optimum dynamic gear package as discussed in this article would have been cost prohibitive only a decade ago, and even today would still be more expensive and require more space than conventional gear, the size and costs have come down substantially in recent years to the point that viable options are often available today, especially during system upgrades or new installations. For most critical operation situations, the benefits far outweigh the costs.

Specific details and options for connecting and utilizing the switchgear and control equipment discussed are too complex and site-specific to address in this article. Applications may be limited by the facility's current electrical system design and available space. However, the configurations discussed present a rather straightforward application for assessment by engineers, equipment suppliers and contractors.

The ideal scheme would incorporate

properly designed switchgear, distribution network, and control systems with fail-safe and redundancy design to ensure maximum reliable operations and flexible gen-set controls for paralleling and soft loading with both the utility and each other, and including pre-programmed load shedding controls to manage non-essential circuits when sufficient power (or fuel supply) is not available. In addition, built-in provisions to readily connect external (mobile or temporary) gen-sets as needed would be advantageous.

The gear should allow for ongoing, extended system testing and verification to ensure maximum reliability of the entire On-Site Power system. The use of paralleling gear with soft-loading and load-shed control allows for full system testing under actual site conditions.

On-Site Power systems should be regularly operated under actual site load conditions for extended periods while implementing a continuous commissioning (testing and verification) process. Weekly testing with engines artificially loaded with



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some minimal “dummy” or lighting loads are typically inadequate and may lead to false security in the system. In fact, inadequate loading and testing can contribute to significant system maintenance issues and even system failures in a crisis! Some guidelines suggest a weekly minimum loading of at least 30% of rated capacity to ensure engine maintenance issues are addressed, but even this can be too low to truly test the system’s ability to pick-up and maintain actual site loads in a crisis.

Inexpensive switchgear arrangements, typically installed to save money and space, will prevent most On-Site Power systems from being regularly tested under sufficient loads to be maintained properly. Fear of causing an electrical disturbance or even a site outage prevents most facility administrators from attempting to transfer loads for a regular testing event. In most cases, the only time an On-Site Power system is truly tested under site conditions is AFTER there is a utility outage! Operators stand back with “fingers crossed” hoping the gen-sets will successfully pick up the load and run. Otherwise, they must manually isolate site loads, attempt to re-start the gen-set, and then attempt to add load manually while not tripping off line. This can be a highly stressful activity, especially if the site is experiencing a catastrophic event at the time. Obviously, this is the worst time possible to find out that a gen-set or transfer switch is not working properly!

Automatic (with manual override) load

shedding and isolation gear within the site’s electrical distribution system can be controlled through the main paralleling system and can be programmed to automatically shed non-essential loads during a hard start scenario, or should the site’s loads exceed the capacity of the generators, or if there is a sudden loss of generator capacity (unplanned shut down). This same process can generally be accomplished

**Inexpensive switchgear arrangements, typically installed to save money and space, will prevent most On-Site Power systems from being regularly tested under sufficient loads to be maintained properly.**

manually as long as sufficient isolation has been designed into the distribution system. A detailed load shedding plan and sequence would need to be in place for operational personnel to follow quickly during an event.

### Fuel Supply Issues and Options

All energy delivery systems (i.e. electric, natural gas, liquid fuel, etc.) have inherent limitations and are susceptible to interrup-

tions during extreme event conditions.

While U.S. electric utilities provide outstanding service reliability under normal operations, the gross transmission grid and regional operations are susceptible to interruptions, especially those due to extreme external events. Because electrical generation, transmission and distribution systems tend to operate on a complex system dependent on overhead line and exposed structure, these systems are more sensitive to extreme events and require more operational hands-on activity to maintain service.

Natural gas pipeline delivery can be deemed somewhat more reliable during such extreme events inherently due to the less complex mechanical and underground nature of the system. While system gas pressure can be lost and pipeline ruptures have occurred, it would be extremely unusual for such a (large) regional outage to take place, but not entirely impossible.

Pre-stored on-site liquid fuel (i.e. diesel) has always been viewed as the most reliable On-Site Power option, although the actual delivery process to replenish supplies is likely the most vulnerable to any extreme conditions event. Flooding, transportation system blockages, and quarantines are just a few issues that would prevent reliable fuel delivery.

In harsh reality, none of the major fuel (or power) supply systems can be viewed as 100% reliable during an extreme event condition. Therefore, a logical approach to



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reduce risk from any one or even two energy supply systems failing would require that a site consider deploying all three to maximize reliability.

Because most facilities take their main source of power from the grid, this option will be considered the default, primary supply. Of course critical sites can usually arrange for multiple electrical feeders to supply their facilities with these feeders even originating at different substations where possible. Dual feeder switchgear can then be used to ride through localized utility events, but these systems would likely have little value during an extreme event when regional utility power is off.

Assuming normal utility power supply will not be an option during these extreme event conditions, it is necessary to focus on On-Site Power generation options. From a fuel supply perspective, the preferred approach would be either to make provisions to store large amounts of on-site liquid fuel, or to utilize a multi-fuel source to generate power. For instance, a site with 100% diesel On-Site Power con-

sidering a multi-week operation capability could be faced with storing many tens of thousands of gallons of fuel, and well over 100,000 gallons in larger facilities. Physical space requirements, safety, and proper fuel maintenance are always issues with fuel storage, and more storage capacity only increases the magnitude of these issues.

A multi-fuel approach can either utilize engines designed or modified to burn both natural gas and diesel (i.e. dual fuel or bi-fuel engines) or to use a mix of both 100% natural gas and 100% diesel engines in the On-Site Power scheme. A similar option could use site-stored liquefied gas to back up natural gas gen-sets.

While multi-fuel and bi-fuel options are a rather innovative feature, their use can provide improved reliability and they have potential for excellent longer-term operational capability. Dual-fuel engines capable of full operation on either diesel or natural gas are typically more expensive and can present operational issues. Recent availability of externally bi-fueled modification equipment seems to provide a very reason-

able approach to adding partial natural gas capability to a 100% diesel engine. This bi-fueled diesel option typically burning 60% to 80% natural gas could allow for extended run times without significantly increasing on-site liquid fuel storage. However, these bi-fuel diesels must have a diesel refuel supply since they will NOT start or operate on natural gas alone. They can, however, continue to operate on 100% diesel should natural gas supply not be available. Therefore, should the site-stored diesel fuel be depleted and refuel delivery is not possible, these bi-fueled engines will not operate after the stored diesel is depleted regardless of the availability of natural gas.

Because natural gas engines of a similar size (kW output) tend to be more costly than equivalent diesel engines, the choice to mix 100% natural gas engines in the site-power scheme will be more costly. In addition, natural gas engines do not tend to have near the load pick-up capacity for starting large power loads or motors and this could be a limiting issue when



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selecting appropriate equipment. **An important consideration for incorporating some natural gas gen-sets in the On-Site Power scheme is that they could be continuously used to meet ongoing On-Site Power and thermal loads in a cogeneration or “combined heat and power” (CHP) arrangement that provides attractive energy cost savings opportunities. This CHP arrangement could actually save enough energy costs to help pay for the entire On-Site Power system.**

All things considered, an optimized mix of diesel and natural gas fueled engine gen-sets would provide for maximized fuel reliability, especially for extended run time conditions. Depending on the anticipated fuel availability during an extended event, fuel can be dispatched to maximize ultimate run time. For example, if diesel fuel re-supply will likely not be available, the system can be loaded to run on maximum natural gas capacity, conserving the site diesel for maximum run time.

### The Real World Situation

It is interesting to observe how often an On-Site Power system will consist of a single, 20+ year old, day-tank fueled diesel gen-set with a closed transition switchgear scheme. These systems are rarely tested under full site-load conditions unless an actual utility outage requires their operation. It is no wonder that these systems can experience a high rate of failure to start or to sufficiently pick up rated load. Even when operating, the run time available from the site-stored fuel is usually limited to a number of hours. While this scheme may actually be adequate for some non-critical operations, it is clearly not representative of the approach being recommended here. In fact, given the extreme event circumstances previously discussed, these systems may likely not even be suitable for many second-tier applications such as hotels, grocery stores, and gasoline stations. Certainly facilities such as hospitals, emergency response centers, nursing homes, communication systems, airports, water and sewage treatment plants, etc. would do well to re-examine the realistic support these systems would offer during an extended event situation.

There is **no specific configuration for On-Site Power that is “set in concrete”**. Different facilities may find multiple schemes that could offer acceptable levels

of reliability. As with all projects, weighing costs against benefits and risks will dictate the proper course of action. To demonstrate this point, this article concludes with a simplified example of a potential On-Site Power project.

### Simplified Example Project

To better demonstrate a typical approach to an On-Site Power plan, here's an example of how an acceptable scheme might be deployed. It should be noted that while the 4,000 kW On-Site Power system example may be considered larger than average, it allows for a better appreciation of the issues, options, and considerations being addressed.

**Sample Site Parameters:** A 4,000 kW On-Site Power system has been installed in an N+1 configuration to meet an On-Site Power supply load calculated at approximately 3,000 kW. In addition, it has been determined that a mission critical (i.e. reduced but sustainable critical operations) loading of 2,000 kW should sustain all critical operations if fuel supplies are curtailed.

For purposes of the criteria as presented in this article, it is being proposed that an On-Site Power system have the capability to:

- **Standard Operations:** Operate indefinitely at full load (3,000 kW) assuming refuel supply is available.
- **Constrained Operations:** Assuming availability of natural gas but with restricted diesel refuel, operate mission critical loading (2,000 kW) for 21 days.
- **Worst Case Operations:** Using only site-stored fuel when no external fuel supply (i.e. no diesel or natural gas) is available, operate mission critical loading (2,000 kW) for a minimum of 7 days.

### The Project Plan

**On-Site Power Scheme - 1:** Installed four 1,000 kW diesel gen-sets (N+1 plan for the 3,000 kW full load) that have been bi-fuel adapted to operate on a ~75% partial natural gas mixture.

**Alternate Scheme – 2:** Install two 1,000 kW diesels and two 1,000 kW natural gas engines).

**Alternate Scheme – 3:** Install two 2,000 kW gen-sets (this approach would provide N+1 coverage of the 2,000 kW mission

critical load) with either both gen-sets being bi-fuel diesels, or one gen-set each of diesel and natural gas.

**Fuel Storage:** Assuming the anticipated diesel fuel consumed to meet the mission critical 2,000 kW level is approximately 150 gallons/hr, the 7-day operational criteria would dictate a minimum site-storage volume of approximately 25,000 gallons. Assuming natural gas bi-fuel operations would allow for at least 66% gas fuel, this storage volume would also extend the site's diesel fuel to the required 21 days.

**Electrical Gear:** Install dynamic interconnection gear allowing for utility and gen-sets paralleling, soft loading, and load shedding as described in article. System would facilitate regular, full capacity testing under site load conditions.

To give an interesting alternative viewpoint for this same example, it should be noted that while the four bi-fueled diesel gen-set selection of Scheme-1 met the required criteria, the system did not have the capability to operate any engines on 100% natural gas such that, without ongoing diesel refueling, the system could not operate past the 21 day bi-fuel limits as described. However, had the facility chosen the alternate schemes with the 100% natural gas engines, then as long as natural gas was available, the facility could operate mission critical indefinitely, and would still have had the seven days of stored-fuel diesel operation in the event that both gas and diesel supply been curtailed.

### About the Author

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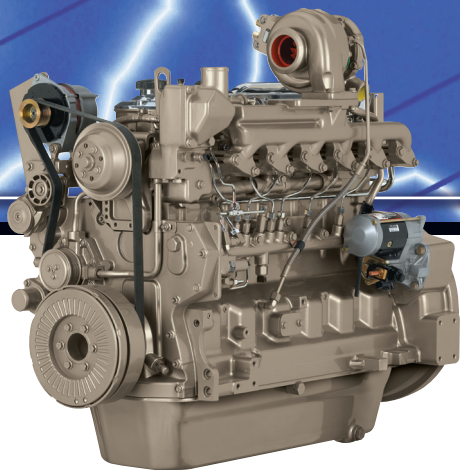
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# The Increased Need for Generator Expertise in a Changing Marketplace

By Dan Popp, PM Technologies, LLC

The past two years have been a whirlwind in the emergency power generation marketplace. Two major acquisitions of generator manufacturers will continue to have effects on the overall marketplace for the next couple of years as distributorships and return on investment (ROI) initiatives are exhaustively reviewed to figure where the true profit centers are—or aren't.

The introduction of very easily attainable generator systems to the general purchasing market has also changed the landscape. A homeowner can go into his local big box home store and purchase a generator system; the local electrical contractor can walk into his electrical warehouse distributor and purchase a commercial system; and anyone with internet access can sit down and order an industrial 2MW generator off the internet, as long as their credit card limit will allow it! The lack of inclement weather in the Southeast region in 2006 and 2007 has contributed to this accessibility as well as volume purchases added to inventories that did not leave the warehouse.

All of these dynamics have changed the marketplace—sometimes for the worse—and have made the generator expert's responsibility in specifying the correct equipment and maintaining it that much more important.

In a market where systems are easily obtained without the input of the generator expert, mistakes are bound to occur. We recently had a residential customer call us for a "service" issue. The system would not work the way he wanted it to and the installing contractor was his wits' end with the entire situation. Upon review, the contractor had purchased one of the readily available generator systems and installed it with a service entrance rated transfer switch.

No problem, right? These applications are put in every day, or so the customer was led to believe. The application consisted of a 15,000 sq. ft. home with six independent A/C systems, fresh air system, automation system and more. This would be a chore for a commercial grade system, let alone for the installed air-cooled system!

What the customer and contractor both

learned is there is a reason generator system application engineers exist. This was an expensive lesson and, unfortunately, one that we also see far too often in commercial and industrial applications as well. How about 63 2KV portable UPS backup systems in an office complex setting? The customer could not understand why the 35kW generator he just had installed would not work.

One of the largest issues we see is the majority of people responsible for miscalculating a generator system look at panel ratings and ignore, or don't understand, motor starting loads, non-linear loads, older poor power factor equipment, voltage dip, frequency dip, voltage total harmonic distortion, etc. and how one or a combination of several can influence the selection of the generator system. The goal is to specify a system that meets the requirements of the application—not just the budget.

Site load studies are a fantastic way to ensure the customer gets exactly what he requires. They also offer another way for a company to expand its service offerings outside of just maintenance related tasks. The initial cost of the equipment needed for these types of services is easily recouped once your customer base is aware you can offer them the service.

Communicating with the specifying engineers and allowing them access to and training them in the use of sizing programs will not only put you in a favorable position with an engineer, it also keeps those headaches at bay during commissioning! Almost all generator manufacturers have readily available sizing programs, the majority of them located on their web sites for free—just be aware a manufacturer's sizing program will size the application for its own specific, available products portfolio.

One of the first things to do in sizing a generator set is to figure out specifically what the project involves. This may seem obvious, but on many occasions we have encountered a "boiler plate" specification that does not fully fit the application. What is the minimum generator loading? An under-loaded generator will fail prematurely due to excessive carbon build up and non-optimal engine operating temperatures.

What is the supplied loads allowable voltage and frequency dip? If the equipment can only sustain a 15% voltage dip and the system is sized for 30% voltage dip, the supplied equipment powered by the generator may not work, or worse, be damaged. Is the system going to be used for emergency situations only, or will it be for continuous prime power use? Standby applications usually do not have an "overload" capability.

Once the project specifics are verified, we need to identify the equipment the generator set will power. When non-linear loads are present, such as UPS systems, VFD's, certain types of non-incandescent lighting, etc., it may be necessary to oversize the alternator in an effort to offset the total harmonic distortion (THD) these types of equipment produce. Less than 15% distortion is a good number to shoot for—the lower the better, but this number is affected by the equipment the generator will be powering, so be aware of it on the front end! When THD issues arise, they ultimately play havoc with the generator's ability to maintain a steady state output voltage. Under-loaded UPS systems and power factor correction devices can also affect the voltage output from the voltage regulation system as the voltage regulator will attempt to compensate for a leading power factor situation. PME/PMG style alternators are considered standard fair for these applications vs. a self excited arrangement, as the voltage regulator will be that much more isolated from the effects of high amounts of THD. Imbalanced loads, large motor loads, peak loads, etc., also play a large part in the generator sizing equation. Again, today's available sizing programs can account for these variables in great detail.

Properly sequenced load steps are another factor that can affect generator sizing. If a system does not have to meet the requirement to pick up 100% of the load upon the initial transfer, then the generator expert may be able to adjust the generator



Dan Popp



## The Increased Need for Generator Expertise

sizing based on the project's motor starting requirements. By sequencing them in such a way that the largest motor starts first, we effectively reduce the starting requirements the generator system will see as subsequent loads come on line. The generator system can actually be REDUCED in capacity when sequencing is allowable. Customers love the cost savings and the generator expert looks like the hero.

After the system is sized correctly and installed, someone needs to maintain it. Load bank testing, routine maintenance protocols and manufacturer's maintenance schedules, when adhered to, will ensure your hard-earned customer is happy with your services and their emergency power investment for years to come. Remote monitoring has become a great way to offer a service to your customers by selling them a peace of mind in that the generator is under constant "supervision" by the generator expert they count on. NFPA and Joint Commission accreditation testing can also be a constant revenue stream for the generator expert and give him access to organizations that specify emergency power systems as a requirement for operation.

A comprehensive testing and preventive maintenance program will reduce preventable failures and raise the uptime percentage of the customer's generator system. Generator failures can result from several common maintenance issues. Some of the most common are:

- 1) Starting-system issues (i.e. batteries, cable connections, chargers);
- 2) Poor fuel quality;
- 3) Process control issues;
- 4) Inadequate loading of generators during test cycles;
- 5) Engine sub-assembly item failures.

EGSA and other bodies associated with generator set standards report about half of emergency generator set failures are due to battery and battery system related problems. Choosing the correct battery and maintaining it properly can prevent the majority of battery failures. Assuring the charger is operating correctly and maintaining equalization on the cells is paramount.

Fuel-related issues are the second most common failure point in emergency generator systems. This can be from poorly maintained diesel fuel storage tanks

clogged with algae and bacteria growth to natural gas system issues from improperly sized gas meters, pressure regulators and fuel lines. Diesel fuel polishing is another potential service offering in the generator expert's service arsenal.

Control issues are typically wrung out and addressed during commissioning, but with the sophistication of today's paralleling, load shedding and utility interfacing controls and complicated software programs used to control them to an exacting degree, unforeseen issues can and do arise when the situation is less than ideal. A solid monthly testing program, like those specified by the NFPA and Joint Commission, will find and eliminate sequence-of-operation errors and resolve them before an emergency arises.

Insufficient loading causes wet stacking and accelerated wear of critical engine components. Generators will last longer if they run at a higher temperature, which ideally means loading the generator to at least 60 percent or more of rated load. Running diesel generators at no to low loads can cause carbon build-up on internal engine components, unburned

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fuel accumulation in exhaust systems and degradation of fuel injectors, engine valves and turbochargers.

Engine sub-assembly items are on the engine and generator, such as water pumps, fuel pumps, cooling systems/radiators and charge air coolers. One of the highest failure items in this category are the system's block heaters. The block heaters maintain the engine's coolant temperature approximately up to 100 degrees above the ambient temperature to facilitate cold weather starting and control accelerated wear from immediate loading by helping maintain normal operating temperature tolerances in the engine.

A properly sized and maintained generator system will allow the generator expert to shine for years to come because it will work when the customer needs it and with a little work up front will help facilitate what we all want to achieve—happy customers, referral business and increased profitability from becoming the “go-to-guys.” The generator expert: an indispensable part of the power generation industry.

### About the Author

Dan Popp is currently the owner of PM Technologies, LLC, a Michigan based distributor of emergency and prime power generation equipment. He formed the company in 1998 and has grown the organization into an Inc. 5000 rated fast-growing private U.S. companies. Prior to starting PM Technologies, Mr. Popp was directly involved in the EPG division for a Caterpillar dealership where he was instrumental in the product sales and service support of emergency, prime power and cogeneration equipment. Dan has over 15 years of experience in co-generation, standby, continuous power and distributed generation systems along with complex electrical switches and switching systems. He is experienced in general management, engineering, operations, sales and marketing. He has an Occupational Studies Degree in Heavy Industrial Diesel and Electrical Power Generation and also has extensive training on proton exchange membrane fuel cell technology. ■

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# Get an On-Site Power Education.

## Get CEUs.

## Get Satisfaction.

Whether you are a newcomer to the On-Site Power Generation Industry or a veteran already working with power generation technology, EGSA's On-Site Power Generation Schools offer you comprehensive information you won't find anywhere else.

While newcomers receive an outstanding introduction to On-Site Power Generation Systems, veterans tell us that our schools provide a great and very meaningful review of critical material. Everybody benefits by getting the most up-to-date information available that is presented by seasoned professionals from some of the biggest companies in the industry.

From voltage regulators to transfer switches to sizing and service, we cover it all in a three-day event. And every student receives a copy of EGSA's 597-page *On-Site Power Generation Reference Book* (a \$225 value) and extensive handout materials.

What's more, you can extend your learning with two extra days of optional sessions that cover prime mover fundamentals, basic electricity, troubleshooting, specifications and bid documents and multiple generator configurations.

With our Continuing Education Unit program, you can earn up to 3.1 CEUs. By earning CEUs you can not only take pride in your accomplishments and knowledge, our CEUs might give you an advantage during your next performance review and your employer will know that the investment in your training has been money well spent. Plus, CEUs may help maintain licenses and professional society membership. When you register for the school, be sure to sign up to take the Continuing Education tests.

For complete information on EGSA's On-Site Power Schools—including a schedule and registration materials—and full details on our Continuing Education program, visit us online at [www.EGSA.org](http://www.EGSA.org).

### **Electrical Generating Systems Association**

1650 South Dixie Highway, Suite 500

Boca Raton, FL 33432

Email us at [e-mail@egsa.org](mailto:e-mail@egsa.org)

Visit us online at [www.EGSA.org](http://www.EGSA.org)







# Application for Membership

## ELECTRICAL GENERATING SYSTEMS ASSOCIATION

1650 South Dixie Highway, Suite 500, Boca Raton, FL 33432 • (561) 750-5575 • FAX (561) 395-8557

E-Mail: [e-mail@egsa.org](mailto:e-mail@egsa.org) • World Wide Web: [www.egsa.org](http://www.egsa.org)

EGSA's mission is to bring together representatives of the various segments of the On-Site Power Industry, to learn, share ideas and experiences, advance the science of On-Site Power generation, improve performance and profitability of members, and the quality of service to power users.

### 1. Contact Information

Please type or print all information in upper and lower case (NOT ALL CAPS!)

Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State/Province \_\_\_\_\_  
Zip/Postal Code \_\_\_\_\_ Country \_\_\_\_\_  
Phone \_\_\_\_\_ FAX \_\_\_\_\_  
Official Representative \_\_\_\_\_ Title \_\_\_\_\_  
Representative's E-Mail \_\_\_\_\_ Company's Web Address \_\_\_\_\_  
How did you hear about EGSA? ☐ Web site ☐ Powerline magazine ☐ Colleague ☐ POWER-GEN ☐ Other \_\_\_\_\_  
Why are you joining EGSA? ☐ Certification Program ☐ CEU Program ☐ Power Schools ☐ Buyers Guide Listing ☐ Other \_\_\_\_\_

### 2. Member Classification

Read the Membership classifications below and check the box that describes your firm's classification.

#### I. FULL MEMBERSHIP

##### ☐ MF **Manufacturer Membership**

Any individual, sole proprietor, partnership or corporation seeking membership must apply for a Full Membership as a manufacturer if they meet one or more of the following criteria:

1. They manufacture prime movers for power generation.
2. They manufacture generators or other power conversion devices producing electricity.
3. They manufacture switchgear or electrical control devices.
4. They manufacture or assemble generator sets, UPS systems, solar power, hydropower, geothermal, or any other power production or conversion system including related components or accessories for national or regional distribution.
5. They are a wholly owned subsidiary of a firm which qualifies under rule one through four.

##### ☐ DD **Distributor/Dealer Membership**

Any individual, sole proprietor, partnership or corporation actively engaged as a distributor or dealer for products listed under Manufacturer Membership may apply for Full Membership as a Distributor/Dealer. If an organization qualifies under Manufacturer Membership, it is not qualified under this section.

##### ☐ CI **Contractor/Integrator Membership**

Any individual, sole proprietor, partnership or corporation actively engaged as a Contractor or Equipment Integrator of products listed under Manufacturer Membership, not brand by brand, geographic territory or contractually obligated as a Distributor/Dealer of a specific product. These firms typically purchase products from a Distributor/Dealer, Manufacturer or Retailer, adding value through installation, product knowledge, relationships, unique services, etc., and then re-sell the resulting product to an end-user.

##### ☐ MR **Manufacturer's Representative Membership**

Any individual, sole proprietor, partnership or corporation actively engaged in the representation of products listed under Manufacturer Membership may apply for Full Membership as a Manufacturer's Representative. If an organization qualifies under Manufacturer Membership, it is not qualified under this section.

##### ☐ EM **Energy Management Company Membership**

Any individual, sole proprietor, partnership or corporation engaged in energy management, including Energy Service Companies (ESCOs), Independent Power Producers (IPPs), Integrators, Aggregators, and other similar enterprises may apply for Full Membership as an Energy Management Company.

##### ☐ **Associate Full Membership** (mark appropriate category at right)

Any individual, sole proprietor, academic institution, student, partnership or corporation meeting the requirements of Associate Regular Membership may apply for Full Membership at their option to enjoy the privileges of Full Membership, including the rights to vote and to serve on EGSA's Board of Directors. Initiation fees and annual dues will be assessed at the existing non-manufacturers' Full Member rates.

#### II. ASSOCIATE REGULAR MEMBERSHIP

##### ☐ AA **Trade Publication Membership**

Any trade publication dealing with the electrical generating systems industry or its suppliers may apply for Associate Membership—Trade Publications.

##### ☐ AB **Trade Association Membership**

Any trade association made up of individual or company members sharing a common interest in the electrical generating systems industry may apply for Associate Membership—Allied Associations.

##### ☐ AC **Engineer Membership**

Any consulting or specifying engineer may apply for Associate Membership—Engineer. Membership may either be held in the employer's name or individual's name under this classification. Individuals whose employer qualify as a Full Member, as described in the Full Membership section, do not qualify for this category.

##### ☐ AD **End-User Membership**

Any individual employee of a company who owns or operates electrical generating equipment and/or related switchgear or components, whose responsibility to his employer includes planning, design, installation, supervision, or service of such equipment may apply for Associate Membership—User. Membership may either be held in the employer's name or individual's name under this classification. Individuals whose employer qualify as a Full Member, as described in the Full Membership section, do not qualify for this category.

##### ☐ AE **Service Membership**

Any individual, organization or academic institution that offers services such as research, testing or repair to the electrical generating systems industry may apply for Associate Membership—Services. Membership may either be held in the individual's name or the organization's name under this classification. Individual companies whose employer or parent organization qualifies as a Full Member, as described in the Full Membership section, do not qualify for this category.

##### ☐ AG **Educational Institution Membership**

Any postsecondary vocational-technical school or college offering on-site power generation-related instruction may apply for Associate Membership—Education Institution.

##### ☐ AR **Retiree Membership**

Any individual who retires from a member company may apply for Associate Membership—Retired. This classification does not apply to any individual who is employed more than 20 hours per week.

##### ☐ AF **Student Membership**

Any individual currently enrolled at an academic institution may apply for Associate Membership—Student.

**Dues Schedule** (Use for Section 3)

|                                  | <b>Annual Dues</b> | <b>Initiation Fee</b> | <b>TOTAL</b> |
|----------------------------------|--------------------|-----------------------|--------------|
| Manufacturer.....                | \$825              | \$200                 | \$825        |
| Energy Management Companies..... | \$825              | 200                   | \$825        |
| Distributor/Dealer.....          | \$285              | \$100                 | \$285        |
| Contractor/Integrator.....       | \$285              | \$100                 | \$285        |
| Manufacturer's Rep.....          | \$285              | \$100                 | \$285        |
| Regular Associate Member.....    | \$200              | \$100                 | \$200        |
| Full Associate Member.....       | \$285              | \$100                 | \$285        |
| Retiree Member.....              | \$90               | \$0                   | \$90         |
| Student Member.....              | Complimentary      | \$0                   | \$0          |

**Initiation Fee is  
Waived Through  
2/29/08!**

**NOTE:** A FULL 12-MONTH DUES PAYMENT MUST BE RECEIVED WITH THIS APPLICATION. The Association's Membership Year is January 1 through December 31. Dues payments that extend beyond the first Membership Year will be applied to the second year's dues.

**FULL PAYMENT MUST BE RECEIVED WITH APPLICATION.****3. Membership Dues** (Please fill in the appropriate TOTAL amount from the above dues schedule.)

Membership Dues \$ \_\_\_\_\_  
 Membership Plaque (optional)\*\* \$ 39.95\*\*  
 On-Site Power Reference Book (optional)\*\* \$ 125.00\*\*

**Florida Residents:** Add 6.5% Sales Tax to \*\* items \$ \_\_\_\_\_

Continental US Residents add \$5 shipping/handling to \*\*items. \$ \_\_\_\_\_

Non Continental US Residents should call EGSA

Headquarters for shipping charges for \*\*items. **TOTAL** \$ \_\_\_\_\_

**4. Payment Method** (Payable in US\$ drawn on U.S. bank, U.S. Money Order, or American Express)

☐ Check # \_\_\_\_\_ Amount \$ \_\_\_\_\_

☐ Money Order

☐ Mastercard ☐ Visa ☐ American Express

Card # \_\_\_\_\_ Exp. Date \_\_\_\_\_

Signature: \_\_\_\_\_

Print Name: \_\_\_\_\_

**5. Products/Services** Please describe the nature of your business (50 words or less, NOT ALL CAPS) If you are a Manufacturer's Representative or Distributor, please indicate which manufacturers you represent and/or distribute for:

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**Available Codes:**

|   |   |   |
|---|---|---|
| 01 ---Batteries/Battery Chargers          | 11 ---Generators/Alternators  | 21 ---Switchgear and Transfer Switches (Automatic or Manual), Bypass Isolation Switches, and/or Switchgear Panels |
| 02 ---Control/Annunciator Systems         | 12 ---Governors   | 22 ---Trailers, Generator Set   |
| 04 ---Enclosures, Generator Set           | 13 ---Heat Recovery Systems   | 23 ---Transformers  |
| 05 ---Engines, Diesel or Gas              | 14 ---Instruments and controls, including meters, gauges, relays, contactors, or switches | 24 ---Uninterruptible Power Supplies  |
| 06 ---Engines, Gas Turbine                | 15 ---Load Banks  | 25 ---Vibration Isolators   |
| 07 ---Engine Starters/Starting Aids       | 16 ---Motor Generator Sets  | 26 ---Voltage Regulators  |
| 08 ---Filters, Lube Oil, Fuel or Air      | 17 ---Radiator/Heat Exchangers  | 27 ---Wiring Devices or Receptacles   |
| 28 ---Fuel Cells                          | 18 ---Relays, Protective or Synchronizing   |   |
| 03 ---Fuel Tanks and Fuel Storage Systems | 19 ---Silencers/Exhaust Systems/Noise Abatement   |   |
| 09 ---Generator Laminations               | 20 ---Solenoids   |   |
| 10 ---Generator Sets                      |   |   |

**Enter codes here:**

**Products sold:** \_\_\_\_\_

**Products rented:** \_\_\_\_\_

**Products serviced:** \_\_\_\_\_

Do you buy AND sell equipment? ☐ Yes ☐ No

Do you manufacture packaged equipment? ☐ Yes ☐ No

**6. Sponsor(s):** A "Sponsor" is an EGSA Member who interested you in filling out this application. It is not mandatory that you have a sponsor for the Board to act favorably on this application; however, if a Member recommended that you consider membership, we request that individual's name and company name for our records.

Sponsor Name \_\_\_\_\_ Company Name \_\_\_\_\_

**7. Official Representative's Authorization**

Signature \_\_\_\_\_ Date \_\_\_\_\_

**25 Years  
of On-Site  
Power  
Education**

# EGSA On-Site **POWER** **GENERATION** **Schools**

**Presenting Our New Two-Tiered School!**

## **Basic On-Site Power Schools**

Phoenix, AZ  
Feb. 12-14, 2008

Milwaukee, WI  
June 24-26, 2008

Orlando, FL  
Dec. 3-5, 2008\*

*\*To be held concurrently  
with POWER-GEN International*

## **Advanced On-Site Power Schools**

New Brunswick, NJ  
April 28-May 1, 2008

Austin, TX  
Oct. 20-23, 2008

For several years, the EGSA Education Committee and School Instructors have been planning and developing the most significant and major curriculum change in the 25-year history of the school: two school levels. The new curriculum is designed to better meet the needs and diverse backgrounds of those who attend our schools.

### **Basic School**

The Basic School is a general, but still technical, overview of On-Site Power Generation equipment. The Basic School is designed for those who are working in non-technical positions (such as Sales or Marketing, Administrative, or Company Management positions) and for those with less than three years experience working in the industry.

Each registrant will receive handout materials and instruction, a copy of EGSA's *On-Site Power Generation: A Reference Book*, and lunch on each of the three days.

### **Advanced School**

In comparison to the Basic School, the Advanced School will offer more highly technical and in-depth coverage of the equipment. The Advanced School is designed for those who have attended the EGSA Basic On-Site Power Generation School; those who are employed in Engineering, Project Management, or Service positions; and for those with over three years working in the industry.

Each registrant will receive handout materials and instruction, a copy of EGSA's *On-Site Power Generation: A Reference Book*, and lunch on each of the four days.



## **Electrical Generating Systems Association**

*The Voice of the Global On-Site Power Industry for over 40 years*

1650 S. Dixie Highway, Suite 500, Boca Raton, FL 33432

561/750-5575 Fax 561/395-8557 e-mail@egsa.org

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• **Live Long and Prosper!**

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PowerPro™ Generators are available with a trailer or as a skid unit and in the following sizes: 25kVA, 45kVA, 65kVA, 100kVA, 125kVA & 150kVA.

Optional accessories include: battery chargers, engine block heaters, cam locks and electronic speed controls.



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[www.getspower.com](http://www.getspower.com)**





# POWER-GEN in The Big Easy

All eyes look to the Big Easy as the On-Site Power Industry gears up for the biggest ticket of the season: POWER-GEN International 2007, to be held December 11-13 at the Ernest N. Morial Convention Center in downtown New Orleans, LA. This year's event is expected to draw more than 17,000 power professionals from 76 countries and over 1,100 exhibiting companies. The Electrical Generating Systems Association (EGSA) will again feature its highly successful On-Site Power Pavilion, a "show within a show" that offers a focus on On-Site Power Generation that is unequaled in the industry.

With about one million square feet of exhibit space, POWER-GEN International maintains its position as the biggest—and most important—of power industry events. By extension, that makes the EGSA On-Site Power Pavilion—located within the heart of the POWER-GEN show—the most important On-Site Power exhibition of the year as well.

## Conference program

This year's On-Site Power session track touches on a wide variety of issues, trends and topics. From global opportunities and trends to exhaust treatment and technological innovation, POWER-GEN's program could very well set the market's tone for months to come.

Thanks to the rising costs of petroleum and the ever-growing

demand for clean, reliable energy, the power industry is facing a myriad of important questions today. Will natural gas prices fall as liquefied natural gas supply projects come online? Has the time come for nuclear power to return to the power generation stage? How large of a role will renewable energy play in the years to come? These questions—and others—will be addressed by this year's conference program.

## EGSA events

EGSA will host its final On-Site Power School for 2007, to be held at the Marriott New Orleans concurrently with the show. Students receive a technical overview of the different parts of an engine generator set, from voltage regulators to switchgear to controls.

Optional seminars on the basics of engines and generators and genset service troubleshooting also are offered before and after the school's "core program." Students also will receive free tickets to walk the POWER-GEN show floor.

Finally, EGSA will hold its annual On-Site Power Reception at the Convention Center on Tuesday, December 11, from 6:15-7:45 p.m. To be held in the Center's Room 343, the reception provides On-Site Power Professionals with an opportunity to network in a relaxed atmosphere steps away from the hectic show floor. For more information, visit [www.EGSA.org](http://www.EGSA.org) ■

## On-Site Power Educational Sessions

### Global Opportunities and Trends in On-Site Power, Decentralized Energy and CHP—Panel Discussion

Chair: David Sweet, WADE  
Co-chair: Richard Brent, WADE

Rising fuel and energy prices and growing attention to climate change issues have created new opportunities for clean and efficient locally produced power. This panel will address markets, technologies and policy issues surrounding this growing industry.

Lynn Rog, UTC Power  
Alex Savelli, Cummins Power Generation  
Chris Lyons, Solar Turbines (invited)  
Nat Treadway, Distributed Energy Financial Group  
Ben Toby, FuelCell Energy Inc. (invited)

### Biofuel and Engine Exhaust Treatment

Chair: Leon J. LeBlanc, Nixon Energy Solutions  
Co-chair: Andrew J. Ulavege, Enercon Eng. Inc.

Presentations will focus on regulatory issues and include health, safety and environmental concerns. Topics will include fuel treatment for landfill, livestock farm and industrial sources plus exhaust treatment technology.

Economical and Effective Biogas Process to Purify Alternative Fuels for Power Generation  
Carmine Fontana, P.Eng.  
and James Smith, Ph.D., P.Eng., Eco-Tec Inc.

The Control of Particulate Matter from Stationary Diesel Engine Exhaust  
Michael Pope, Süd-Chemie Inc.

Emission Complaint Diesel Stand by/ Emergency Generators  
William (Bill) Clary and James McDonald, MIRAT-ECH Corp.

Guaranteed Removal of Siloxanes from Digester and Landfill Gas  
Paul Tower, P.E., MS, Seth Tower, Applied Filter Technology Inc.

Experience of Landfillgas Utilization with Gas Engines  
Martin Schneider, GE Energy;  
Jenbacher Gas Engine Division Austria

### Increased Efficiency Improvement Through Technological Innovation

Chair: John Hoeft, Advanced Marketing Insights  
Co-chair: Ray Kacvinsky, Marathon Electric Mfg. Corp.

On-site power projects are continuously looking for innovative ways to increase the efficiency. Attend this session to learn more about how variable speed power generation increases the prime duty application proforma below 200 kW.

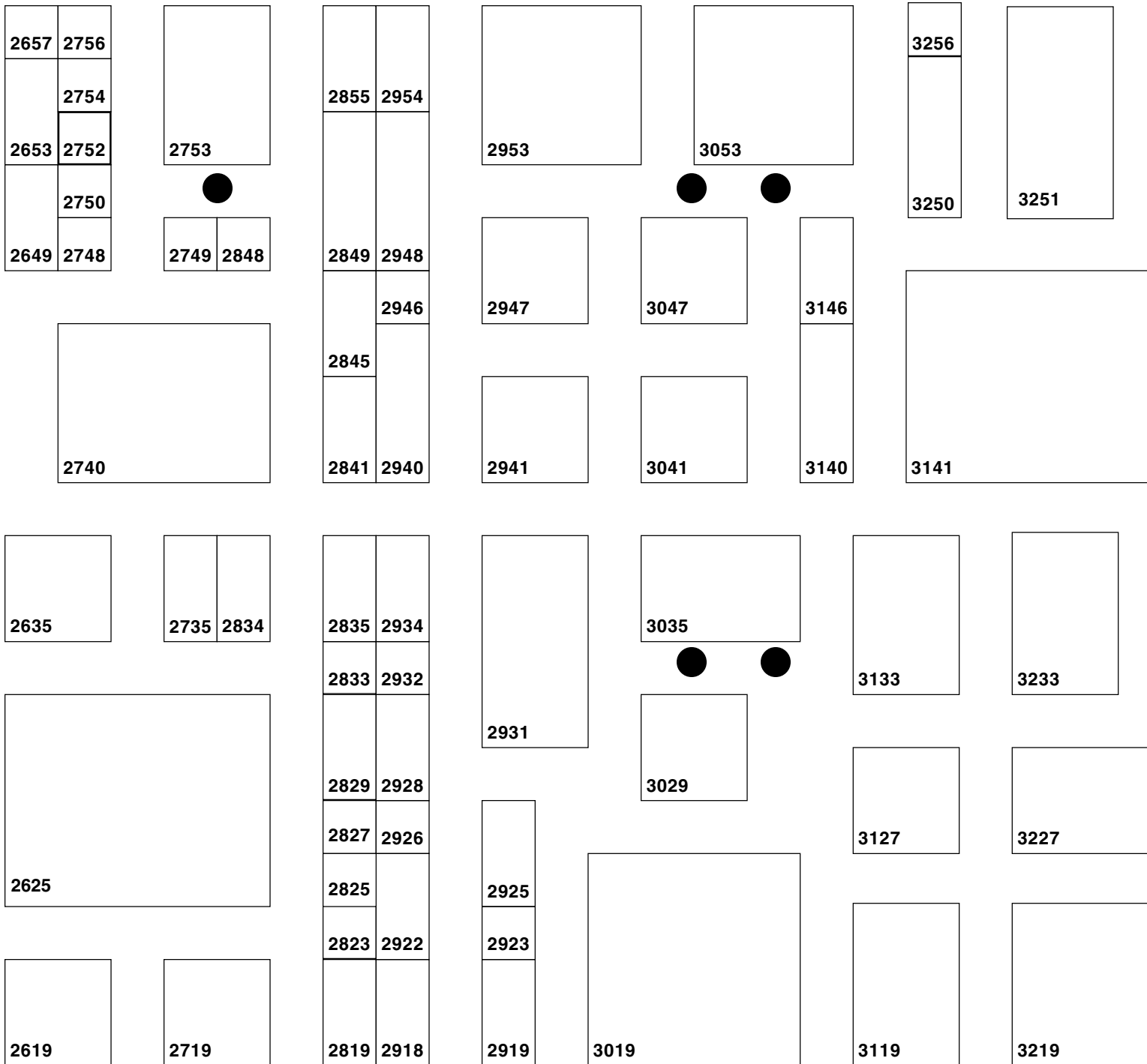
A Technical-Economic Model for Evaluating Emerging Energy Technologies and Cogeneration in Distributed Generation  
Vicente Sanchez, Emerging Energy Technologies

Small Engine CHP Premium Power Module  
Keith Davidson, DE Solutions Inc.;  
Robert Panora, Tecogen Inc.

Variable Speed Gensets: Reduce Fuel Consumption & Optimize Engine Performance

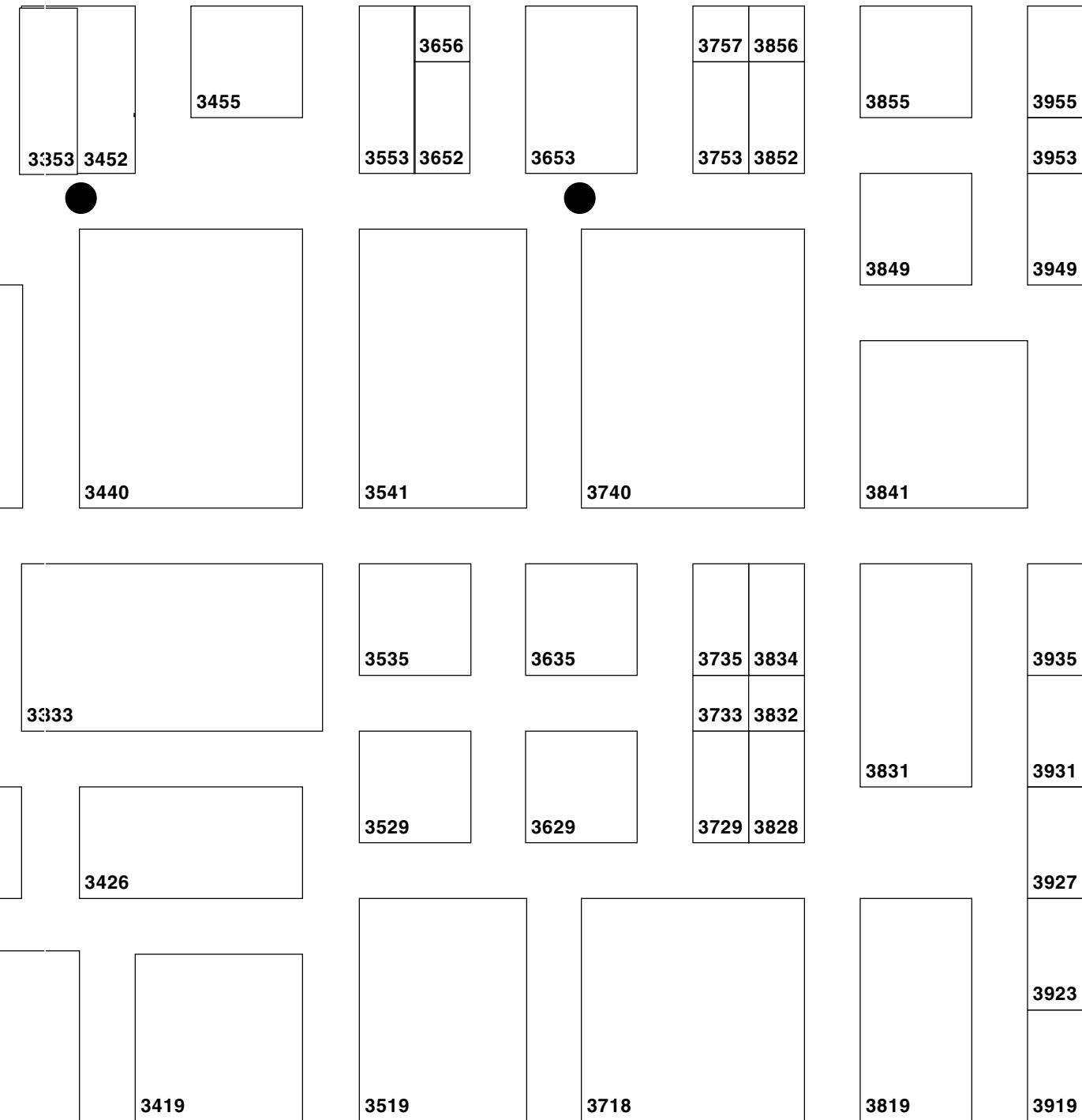
Samuel Beaudoin and  
Chris McMahon, CVT Corp.

Increased Fuel Efficiency Improvement Through Technological Innovation  
Matthew Johnston, Light Engineering Inc.



# The EGSA On-Site Power Pavilion





# at POWER-GEN International 2007

| Exhibitor   | Booth #     | Exhibitor  | Booth #     |
|---|-------------|--|-------------|
| Aircogen CHP Solutions Inc.....                       | 2827        | METSO Minerals/Flexowell.....  | 3250        |
| Alturdyne/Precise Power.....                          | 2657        | <b>Mid America Engine .....</b>  | <b>3735</b> |
| Alum-Tek Industries LTD.....                          | 2932        | Mission Critical .....   | 2833        |
| ARE-Energy .....                                      | 2750        | Mitsubishi Engine North America .....                                  | 3519        |
| <b>ASCO Power Technologies.....</b>                   | <b>3419</b> | <b>MMD Equipment.....</b>  | <b>3718</b> |
| <b>Avtron Mfg.....</b>                                | <b>2845</b> | Motortech.....   | 3029        |
| <b>Baldor Electric .....</b>                          | <b>2931</b> | MQ Power .....   | 3340        |
| <b>Basler Electric .....</b>                          | <b>2947</b> | MTU Detroit Diesel.....  | 3333        |
| Beckwith Electric Co. Inc.....                        | 2925        | Mubea Inc.....   | 2923        |
| Bi-State Rubber, Inc.....                             | 3250        | <b>Murphy, FW .....</b>  | <b>2934</b> |
| Cannon Load Banks, Inc.....                           | 2926        | Opra Turbines, Inc. ....   | 3256        |
| Caterpillar Used Equipment Dealers (Ring Power) ..... | 2849        | PC&S, Inc.....   | 3553        |
| CH2M Hill.....  | 3133        | Perkins Engines Co.....  | 3529        |
| Charles Industries LTD.....                           | 2754        | Phillips and Temro Industries.....                                     | 3455        |
| Checkers Industrial Products Inc .....                | 3831        | Phoenix Products LLC .....   | 3146        |
| <b>Chillicothe Metal Co., Inc.....</b>                | <b>3927</b> | <b>Point Eight Power.....</b>  | <b>3047</b> |
| <b>ComAp LLC.....</b>                                 | <b>3931</b> | Post Glover .....  | 3852        |
| <b>ComRent International.....</b>                     | <b>2653</b> | Power Systems Solutions Inc.....                                       | 2719        |
| Continental Controls Corporation .....                | 3656        | <b>Pritchard Brown, LLC .....</b>                                      | <b>3923</b> |
| Control Switches International, Inc.....              | 2735        | Project Manager-Mobile Electric Power (PM-MEP).....                    | 3353        |
| Deep Sea Electronics, Inc.....                        | 3729        | Quest-Tec Solutions .....  | 2649        |
| Diesel Radiator Company .....                         | 3856        | RCI Technologies.....  | 2855        |
| DynaGen Technologies Inc.....                         | 2835        | <b>Robinson Custom Enclosures .....</b>                                | <b>3535</b> |
| EGSA.....   | 2829        | <b>Rocore .....</b>  | <b>3935</b> |
| Electroswitch.....                                    | 3753        | <b>Russelectric .....</b>  | <b>2619</b> |
| Emerson .....   | 3141        | S&B Engineers and Construction .....                                   | 3949        |
| <b>Enercon Engineering, Inc.....</b>                  | <b>3629</b> | Soft America, Inc.....   | 2748        |
| <b>Gillette Mfg Inc .....</b>                         | <b>3955</b> | SDMO.....  | 2740        |
| Girtz Industries, Inc.....                            | 3251        | SENS (Stored Energy Systems) .....                                     | 3828        |
| <b>Governors America Corp .....</b>                   | <b>3834</b> | Shindaiwa .....  | 3227        |
| <b>GTI - Altronic Inc.....</b>                        | <b>2841</b> | <b>Silex Innovations, Inc.....</b>                                     | <b>3919</b> |
| Guascor .....   | 3653        | Simplex, Inc.....  | 2948        |
| Harco Manufacturing.....                              | 3832        | Smithco Engineering, Inc.....  | 2823        |
| Himoinsa USA, Inc.....                                | 3452        | St. Louis Metallizing.....   | 2834        |
| IEA Inc .....   | 2941        | <b>Süd-Chemie, Inc.....</b>  | <b>3652</b> |
| Indufil .....   | 2819        | Sulzer Chemtech.....   | 2946        |
| Industrial Power Systems .....                        | 3733        | Sulzer Pumps.....  | 2940        |
| <b>John Deere Power Systems .....</b>                 | <b>3819</b> | Tech Solutions International Group, LLC .....                          | 2848, 2749  |
| <b>JRS Custom Fabrication, Inc.....</b>               | <b>2825</b> | Technicon Industries Inc.....  | 2919        |
| Kato Engineering .....                                | 3841        | Terex .....  | 2625        |
| Kawasaki Gas Turbines .....                           | 3233        | Titan Energy.....  | 2918        |
| Kim Hotstart Mfg. Co.....                             | 2928        | TM4.....   | 3757        |
| <b>Kohler Power Systems.....</b>                      | <b>3740</b> | Tradewinds Power Corp .....  | 2753        |
| LaMarche Manufacturing Co.....                        | 3953        | Tramont Corp.....  | 3849        |
| Lombardini USA.....                                   | 2635        | Transtar Electric, Inc.....  | 2752        |
| Lynx Power Systems.....                               | 3855        | Triton Power .....   | 3019        |
| Magnum Products LLC .....                             | 3219        | VMC-Korfund .....  | 2954        |
| Maquinaria IGSA SA de CV .....                        | 3426        | Volvo Penta.....   | 3035        |
| Marathon Electric/Thomson Technology .....            | 3119        | W.A. Benjamin Electric Co.....   | 3140        |
| Maxim Silencers, Inc.....                             | 2756        | Wacker Corporation .....   | 3541        |
| McPherson Controls .....                              | 2922        | Wartsila North America, Inc.....                                       | 3053        |
| Mecc Alte/Magil .....                                 | 3127        | Young Touchstone .....   | 3635        |
| Megawatt Machine Services.....                        | 3041        | <b>Note: advertisers in this issue of Powerline are listed in red.</b> |             |

## Foley, Inc. Announces Changes

Mike Kubas, Vice President and General Manager of Power Systems for Foley, Incorporated, the Caterpillar dealer in North Jersey, Staten Island, and Bermuda, has announced the appointments of Joe Cotignola as Customer Support Sales Representative for Hudson, Essex, and Union counties along with Bermuda, and Bob Dahmer as the Electrical Power Generation (EPG) Technical Communicator.

Cotignola started his career at Foley in 1985 in the Forklift division as a Sales Representative, where he worked for two years until accepting the position of Customer Support Representative (CSR) in the Construction Division.



Joe Cotignola

As a Customer Support Representative for Power Systems, Cotignola's territory includes Hudson, Essex and Union counties. He will also have sales responsibility for Bermuda and be in charge of the program management of Foley's Authorized Marine Dealer (AMD) West End Yachts, Ltd.

Dahmer arrives at Foley with a Bachelor of Science degree in Electrical Engineering Technology from the New Jersey Institute of Technology in Newark, NJ. He has over 20 years of experience in the Electrical Engineering industry, including 15 years as a Project Manager. In his most recent position, Dahmer worked for Present Beckman Coulter Inc., in Somerset, NJ as an Engineering Project Manager, where he was in charge of training domestic and international engineers, along with designing and developing current and future automated sample handling systems.



Bob Dahmer

In his new position, Dahmer will be responsible for communicating technical information to both internal and external customers, along with managing major field service start-ups and repairs, and working with customers to solve technical problems. For more information, visit [www.foleyinc.com](http://www.foleyinc.com).

## Cyber Attack Causes Gen-set to Self-Destruct

CNN reports that researchers who launched an experimental cyber attack caused a generator to self-destruct, alarming the federal government and electrical industry about what might happen if such an attack were carried out on a larger scale. Sources familiar with the experiment said the same attack scenario could be used against generators that produce much of the country's electric grid power. Some experts fear bigger, coordinated attacks could cause widespread damage to electric infrastructure that could take months to fix.

While CNN has honored a request from the Department of Homeland Security not to divulge certain details about the "Auro-ra" experiment (conducted in March at the Department of Energy's Idaho lab), it has published an article about the experiment and posted a previously classified video of the test on its web site at <http://www.cnn.com/2007/US/09/26/power.at.risk/index.html>.

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## Burj Dubai Reach New Heights

Emerson Network Power reports that ASCO Power Technologies will help keep the power on for the world's tallest building: the Burj Dubai Tower in the United Arab Emirates. ASCO is a division of Emerson Network Power.

ASCO is providing 13 power transfer switches and 105 bypass-isolation power transfer switches to the Burj (Arabic for Tower) Dubai Tower, which has set a new record as the tallest building in the world, surpassing the Taipei 101 in Taiwan.

When completed in 2008, Burj Dubai will be the tallest building in the world in all four categories recognized by the Council on Tall Buildings and Urban Habitat: spire height, the highest occupied floor, roof height and pinnacle height.

The building continually sets records for size and construction methods, such as the highest observation deck, the fastest elevators and concrete pumping height. Once complete, the tower will stand an estimated 2300 feet with 160 stories. To get a

better idea of the tower's enormous height, it's almost as tall as the Chrysler Building and Empire State Building would be if they were stacked one on top of the other.

The spire, which contains communications equipment, will be seen from 60 miles away. Chicago-based Skidmore, Owings & Merrill designed the Burj Dubai Tower. The tower joins the Sears Tower in Chicago and the Freedom Tower in New York in the firm's portfolio of super-tall skyscrapers. For more information, visit [www.ascopower.com](http://www.ascopower.com).

## Satellite Launches with Saft

The Optus D2 communications satellite has recently been launched with Saft lithium-ion (Li-ion) technology onboard. The satellite was launched from the Guiana Space Centre in Kourou, French Guiana via the Ariane 5 launcher, which is also equipped with Saft batteries. Orbital Sciences Corporation of Dulles, VA selected Saft's Li-ion batteries for the satellite built for Optus of Australia.

The recent launch marks the 14th spacecraft launched with Saft's Li-ion technology, worldwide. In 2006, Orbital was the first to launch Saft's Li-ion technology into geosynchronous orbit in the United States on a U.S. government satellite, and the first to launch Saft's Li-ion technology in the U.S. on a telecom satellite with Optus D1.

Optus D2 is the second of three GEO telecommunications satellites Optus has ordered from Orbital to provide communication and broadcasting services to Australia and New Zealand. Orbital's GEO satellites are smaller-sized and more affordable to launch than larger, more expensive models. Generating nearly five kilowatts of payload power, these commercial communications satellites are the most powerful satellites produced by Orbital.

Saft specializes in the design and manufacture of high technology batteries for industry. For additional information, visit [www.saftbatteries.com](http://www.saftbatteries.com). ■

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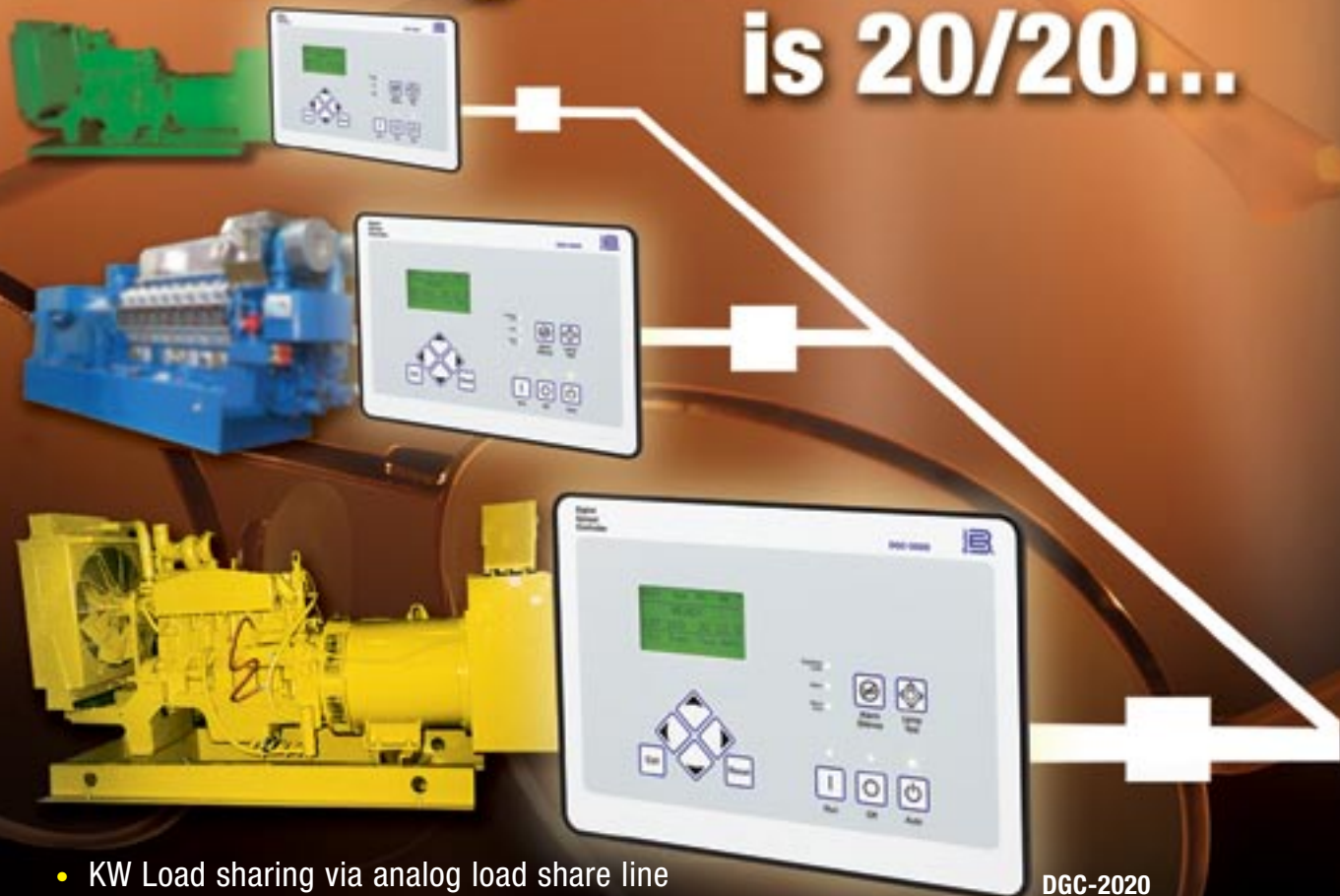
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# Stay on Top of Your Game with EGSA's Electrical Generator Systems Technician Certification Program

Think things move pretty fast in today's business world? Think how fast they'll be moving one, five or even 10 years down the road. That's why you need every advantage to stay on top.

It's no secret that technology is becoming more complex—not less—and that makes today's On-Site Power Generation System a lot more expensive. End-users—your customers—don't want just anybody with a basic knowledge of mechanics to install and maintain their equipment. They want to be confident that all work has been performed by qualified personnel. Suppliers want assurance that skilled technicians are performing maintenance and repairs to guard against unnecessary returns or warranty repairs.

## As Good as Your Word

In the past, your word was the only assurance that your technicians are skilled and knowledgeable. But now, through EGSA's Electrical Generator Systems Technician Certification Program, there is a way that you can back up those words with objective evidence of your technicians' proficiency.



EGSA offers you a big advantage: For the first time in our industry, we have an objective and accurate way to determine generator technician proficiency. That means that the same standards will be used to measure the skills and knowledge of technicians from Maine to Manitoba and Mexico. Yes, Manitoba and Mexico! EGSA has determined that there is no reason why the test could not be fairly applied to any NAFTA technician.

## What are the Benefits?

For the Employer, certification helps ensure that your technicians have the critical knowledge and skills to succeed in their jobs. And everyone will be comfortable knowing that your certified technicians' expertise has been confirmed by the industry organization through a program that was developed by a university. Encour-

aging and helping your technicians become certified signifies your commitment to the highest of standards. Plus, it lends an added level of credibility to your firm and can sharpen your competitive edge. Employing certified techs will promote customer satisfaction and you won't have to be shy about offering assurance that your techs are qualified. Certification can also help you select potential new hires, analyze job performance, evaluate employees and motivate technicians to enhance their skills and knowledge.

Think about the message that certification sends to those with whom you do business. Why would anyone want a technician who isn't certified performing critical maintenance or repair tasks? Employing certified technicians gives you an added tool with which to market your business.

As our members have said, "We've seen too many backyard mechanics damage expensive equipment. This program will provide credibility for my company and will help build pride and a commitment from technicians to be the best."

## For the Technician

Certificate holders benefit too. Certification shows employers, clients, and associates that you are committed as a professional. It provides recognition of your knowledge and skill, shows your commitment to your profession and can help with job advancement. Certification is a mark of excellence that you carry with you everywhere you go.

Acquiring certification indicates that you have the knowledge and proficiency required to perform as an Electrical Generating Systems Technician professional. Becoming certified can increase your salary, enhance your skills, and make your job more satisfying.



*Certification helps ensure that your technicians have the critical knowledge and skills to succeed in their jobs.*



## The Certification Test

EGSA collaborated with Ferris State University to develop the certification test and program. Through a scientific process, our panel of technical experts identified 12 duty areas (such as “Basic Electricity”) and 61 tasks (such as “demonstrate knowledge of AC electrical theory”) within the duty areas. The duty areas and tasks were ranked and rated in terms of their relative importance, the frequency with which a task is performed, and skill level (i.e. Senior/Expert; Intermediate; and Entry Level.) All this data was combined to develop the certification test that was then statistically validated through a pilot test taken by generator technicians from across the United States.

## Who can take the Test?

There are no pre-qualifications for taking the EGSA Certification test. We recommend three or four years of field experience before taking the test. Technicians who have had formal education in On-Site Power Generation (a degree or certificate from a technical school or community college) may need less field experience. Those who pass the test will have a comprehensive knowledge of basic electricity, the functions of a gen-set’s mechanical and electrical components, the interactions and relationships among components and an understanding of various elements of the installation, service, maintenance, and repair of gen-sets and On-Site Power Generation Systems.

## CERTIFICATION TESTING COVERS:

- Automatic Transfer Switches
- Communication & Documentation
- Engine Generator Instrumentation & Controls
- Multiple Generator Switchgear & Controls
- Troubleshooting System Problems
- Auxiliary Support Systems
- Basic Electricity
- Prime Movers
- Governors
- Voltage Regulators
- Generators/Alternators

## Use the Study Guide to Prepare!

Use of the program’s Study Guide is an excellent way to help techs prepare for the test and should clearly indicate if they are ready to take (and pass) the certification exam. In addition to useful formula pages, the guide contains almost 200 multiple choice practice questions that cover all parts of the certification test. In addition to identifying the correct answer, the guide also indicates in most cases why a particular choice is correct

and why the others are incorrect. The Guide also identifies resource material where techs can get additional or more in-depth information about a given topic.

Need more information? Visit [www.egsa.org](http://www.egsa.org) to find extensive and detailed information about the certification program. Or contact EGSA Director of Education George Rowley via e-mail at [g.rowley@egsa.org](mailto:g.rowley@egsa.org).



## DISCLAIMER OF LIABILITY

*Certified status is an indication that an individual has completed a combination of defined education, experience or examination requirements. However, Certification is not a guarantee or assurance of the competence or ability of any particular individual. Further, given the rapid changes in the field, the Electrical Generating Systems Association cannot warrant that the Examination and other Certification materials will at all times reflect the most current state of the art.*

*The Electrical Generating Systems Association disclaims liability for any personal injury, property or other damages of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the Certification Program or the acts or omissions of any person who has been Certified by the Electrical Generating Systems Association. In conducting the Certification Program, including issuing Certifications, the Electrical Generating*

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## Generator Field Technicians

TAW, Inc. is searching for experienced Generator Field Technicians in Tampa, Fort Myers and Pompano Beach, FL. Duties include: inspections, repairs, services and start-up of generators and ATS. Troubleshoot Generators and automatic transfer switches. E-mail resume to [ellen.donegan@tawinc.com](mailto:ellen.donegan@tawinc.com). Fax (813) 612-2609. AA/EOE. DFWP. Check out our web site [www.tawinc.com](http://www.tawinc.com).

## Sales & Service Representative

CJ's Power Systems, Katolight generator distributor, is adding to its Florida sales force. CJ's sells Katolight generators in multiple markets in Florida. This position requires prior experience in generator sales. Must be able to travel locally, possess a good driving record and be computer literate. Salary with commission. Fax a resume and salary history to 1-352-732-0225. Email: [sales@cjspower.com](mailto:sales@cjspower.com).

## Generator Field Technician

W. W. Williams is seeking an experienced Generator Field Technician in the Las Vegas, Nevada area. Responsibilities to include: Start-up, inspection, service, troubleshoot and repair of Generators and ATS. Please email resume to [sgale@wwwwilliams.com](mailto:sgale@wwwwilliams.com) EOE

## EMERGENCY POWER SYSTEM SPECIALISTS

### Generator Technician—Experienced

Emergency Systems Service Company in Quakertown, PA, a leading provider of emergency generator sets, has an immediate opening for a technician with a minimum of three years diesel engine/generator set background/experience. Responsibilities will involve troubleshooting, repair and the planned maintenance services of generator sets and peripheral equipment. A neat appearance, clean driving record and good people skills are required. We offer a highly attractive compensation with an outstanding benefits package. A company vehicle and additional training provided. If you are interested in becoming part of our team, please call (215) 536-4973, ext. 25.

### Generator Technician—Apprentice

Emergency Systems Service Company in Quakertown, PA, a leading provider of emergency generator sets, has an immediate opening for a person with a strong mechanical/electrical background interested in a career in the power generation service field. Responsibilities will involve minor troubleshooting, repair and the planned maintenance services of generator sets and peripheral equipment. A neat appearance, clean driving record and good people skills are required. An outstanding benefits package, company vehicle and additional training provided. If you are interested in becoming part of our team, please call (215) 536-4973, ext. 25.

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## Generator Set Sales/Service

Experienced sales/service engineer needed by southern California company to sell engine generator sets.

Please respond to [J.Kellough@EGSA.org](mailto:J.Kellough@EGSA.org)  
(Reference PLND06JB-1).

## Senior Generator Service Technician

Canton based emergency service company is seeking senior level generator technicians to keep up with growing customer base. The position level requires a full and complete understanding of operating systems, controls and the ability to work with multiple manufacturers' logics and equipment. Strong mechanical background, basic understanding of automatic transfer switches, thorough understanding of electricity and electrical appliances. Technician will also be responsible for leading installation teams on project installs. EGSA certification a plus.

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## Generator Field Technicians

PM Technologies, LLC in Detroit, MI, a leading provider of emergency generator set sales, service and rental has immediate openings for service technicians to assist with our expansion throughout Michigan and Northern Ohio. Duties will include maintenance, troubleshooting of both electrical and engine related issues, start-up of generators and transfer switch/switch gear equipment. 3 or more years experience a plus. Competitive wages, benefits, 401k, vacation, company service vehicle. Please email resume to [dpopp@pmtech.org](mailto:dpopp@pmtech.org) or fax to 248.374.6402

## Outside Service / Sales Representative

PM Technologies, LLC in Detroit, MI, a leading provider of emergency generator set sales, service and rental has an immediate opening for an outside service sales representative to assist with our expansion throughout Michigan and Northern Ohio. Duties will include customer site visits, preparation of quotes and proposals, PO procurement, high end residential generator sales. Prior technical knowledge and experience in selling generator service/products and/or industrial service sales desired. Competitive wages, benefits, 401k, vacation, vehicle allowance. Please email resume to [dpopp@pmtech.org](mailto:dpopp@pmtech.org) or fax to 248.374.6408

**EGSA Job Bank Guidelines**—EGSA will advertise (free of charge) EGSA Members' job openings each issue in the Job Bank. Blind box ads using the EGSA Job Bank address are available upon request. Companies who are not members of EGSA may utilize the Job Bank for a \$300 fee. Please note that company logos may be included for an additional fee. Please send your classified ad (limited to about 50 words) to: **EGSA Job Bank**, 1650 S. Dixie Hwy, Suite 500, Boca Raton, FL 33432. Or, send it via e-mail it to: [J.Kellough@EGSA.org](mailto:J.Kellough@EGSA.org)

## Outside Generator Service Sales Representative

TAW Inc is seeking experienced Outside Service Sales Representative in Orlando, Jacksonville, Fort Myers and Pompano Beach, FL The qualified candidate will sell generator repair services to new and existing clients. Will travel to customer sites within Orlando, Jacksonville, Fort Myers and Pompano Beach and the surrounding areas. Will prepare quotes and proposals. Prior technical knowledge and experience in selling generator products and/or industrial sales desired. E-mail resumes to [ellen.donegan@tawinc.com](mailto:ellen.donegan@tawinc.com) or fax 813-217-8076. AA/EOE. DFWP. Check out our web site [www.tawinc.com](http://www.tawinc.com)

## ATS Service Technician

Canton-based emergency service company is seeking ATS technicians to keep up with growing customer base. This position requires the technician be well-versed in all manufacturers of Automatic Transfer Switches. Technician must be able to understand, maintain, troubleshoot, diagnose, repair and install Automatic Transfer Switches and accessories. The ATS technician should have a thorough understanding of electricity and electrical appliances. ATS technician should also have a working knowledge of the complete electrical generation system.

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# 2008 EGSA Annual Spring Convention

March 16-18, 2008 • Santa Ana Pueblo, NM

## New Roads to Opportunity

### Laughter—There's Nothing Funny About The Way It Sells

Jim Pelley, *Laughter Works Seminars*



Discover how the creative, appropriate use of humor can boost sales and build solid customer rapport. This presentation will give you innovative, practical skills that can lead to a more successful - and enjoyable - career. Learn creative solutions for overcoming rejection jitters and for gaining access to the decision-maker every time. Explore humorous ways to put fun into your sales presentations and proposals. Avoid the pitfall of accidentally offending some-

one with insensitive or inappropriate humor. Discover how positive humor can be an effective way to illustrate the features and benefits of what you sell. This presentation also features a powerful relationship-sales technique used to establish critical rapport and to focus on customer needs.

### Biodiesel Use and Prospects in Power Generation



Larry Barrett, *President, Barrett Consulting Associates*

This presentation will review applications in using biodiesel in power generators and co-generators owned by utilities and by end-use customers, such as manufacturing plants, universities and military facilities. It will discuss the reasons for choosing biodiesel and how biodiesel performs in power generators. Opportunities for increasing the use of biodiesel for power generation in both utility

and end-use customer market segments, such as airports, data centers, hospitals, and water treatment plants will also be discussed.

Biodiesel fuel is producing power in a small but growing number of locations. The range of applications serves needs for emergency power, peaking power, and even for baseload or continuous operations in remote locations. There is also experience with cogeneration applications. Biodiesel offers several potential benefits to diesel engines including smoother operations, reduced emissions, and increased fuel flexibility. Biodiesel can turn diesel engines into "green" generators with potential benefits from renewable energy credits.

### Variable Speed Gensets: How Do They Work and Do They Work?



Samuel Beaudoin, *V.P. and CTO, CVT Corp.*

This presentation will discuss alternative solutions to save fuel using variable speed generators. As the cost of fuel increases, emission standards become more stringent and as new technologies start to reach the market there are various solutions which make economic sense. We will cover what solutions are available and the savings one can expect. Not all solutions are right for everyone. To evaluate if a solution is right,

one needs to look at their load requirements, the physical environment it will be in, budgets and type of usage. Also discussed will be what applications a variable speed generator may not be appropriate for given their drawbacks and in which instances they may be a perfect fit.

### Additional Scheduled Educational Sessions

- Emissions Panel
- CHP Opportunities at Ethanol Plants
- Design Build Concepts

### Manufacturers Showcase

The exhibit hall is open for 2.5 hours during the Conference, thus allowing ample time for Exhibitors to interact with attendees. Manufacturers, Manufacturer's Reps, Consultants, or any company that offers a service to Distributor/Dealers are encouraged to exhibit in the Showcase. Here, they will interact with Manufacturers, Distributor/Dealers, Manufacturer's Reps, and Consultants who are interested in On-Site Power products and services. **Reserve your tabletop today!**



### Hotel

*Hyatt Regency Tamaya Resort & Spa*

Brilliant mountain sunsets and the majestic Rio Grande create an impressive backdrop to Hyatt Regency Tamaya, a golf and spa resort located on the lands of the Native American Pueblo of Santa Ana. The Hyatt Tamaya Resort & Spa is a place where the people, their culture and the land are one. The resort is reminiscent of the dwelling of the Santa Ana Pueblo from old. The Pueblo community's Tribal history and culture are reflected in every aspect of the resort. The moment you step into the entry courtyard you will feel the history of the surrounding lands. The resort has a spa, stables, three pools, and a golf course.



The room rate is \$179.00 single/double per night, plus a \$14 resort fee per night. The tax is currently 11.5%. This rate is available from Monday, March 10 through Saturday, March 22, 2008. Internet in the guest rooms is \$6. The deadline for hotel reservations is February 15, 2008. After this date, reservations will be accepted on a space and rate availability basis. All reservations must be accompanied by one night's deposit plus tax or guaranteed by a major credit card. Deposits are only refundable for cancellations made three days prior to arrival.

### Networking Event Sponsorship Opportunities

The EGSA Board of Directors has created several Corporate Sponsorship opportunities specifically designed to give On-Site Power firms additional exposure during EGSA Conferences and Conventions. Firms may elect to sponsor one or more of the designated events.

### More Information

Complete details on the 2008 Annual Spring Convention will be available on our web site at [www.egsa.org](http://www.egsa.org) in January.



### Electrical Generating Systems Association

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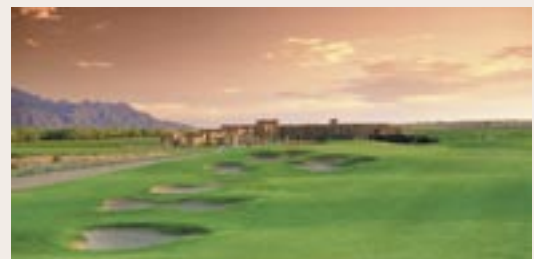
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### EGSA Golf Tournament

*Twin Warriors Golf Club*



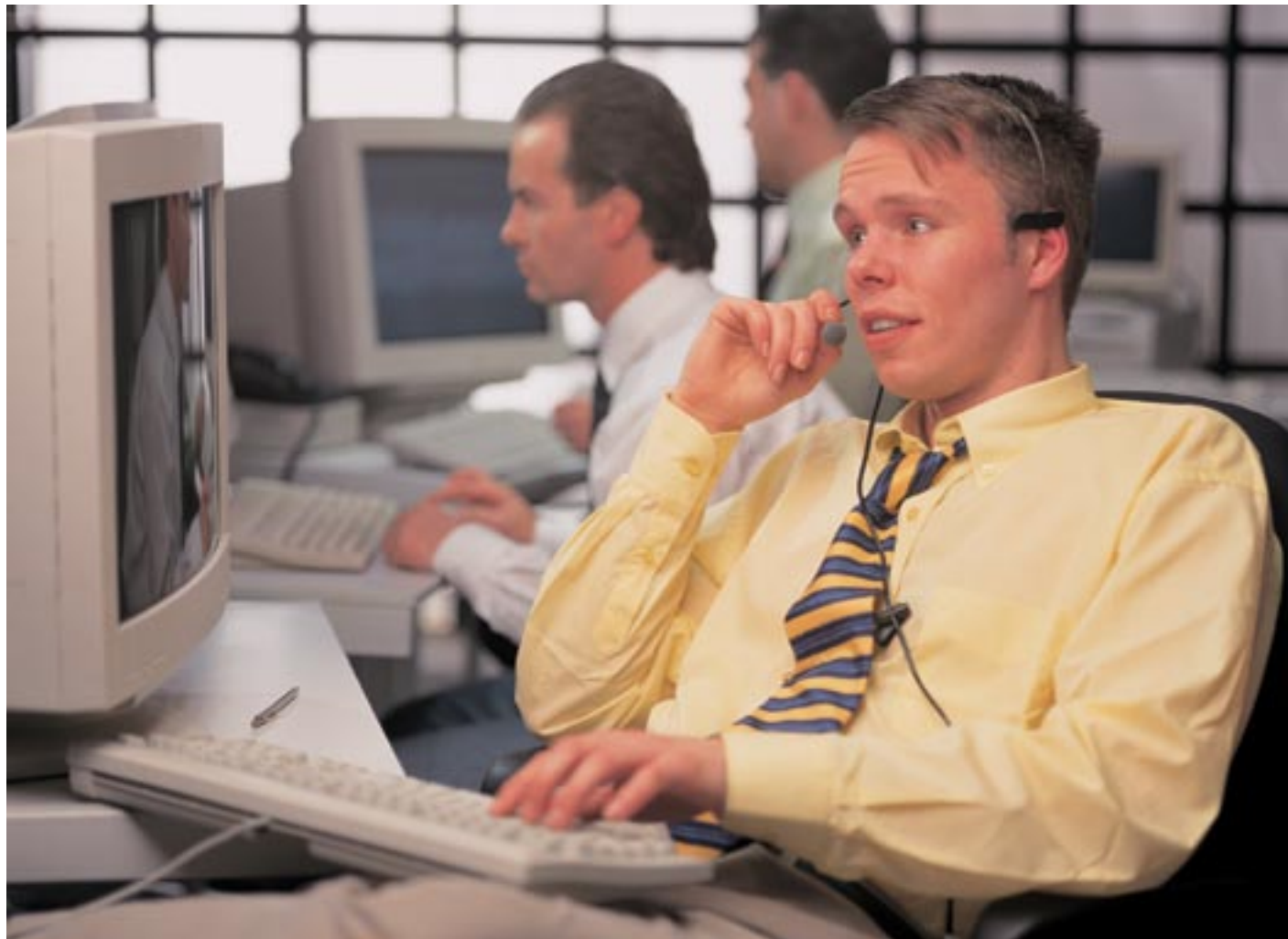
Routed in and around 20 ancient cultural sites of previous habitation and activity, this spectacular New Mexico golf course—ranked #49 by *Golf Digest* for public courses in 2005 and host facility for the 36th PGA Club Professional Championship in 2003—has beautiful grassy knolls and ridges dotted with Juniper and Pinon Pine. Wonderful dry washes known as arroyos and eroded land features, along with the sacred butte known as Tuyuna Mesa, complete a picture framed with spectacular views of the Sandia Mountains. Twin Warriors Golf Club, designed and developed by Gary Pankes with meticulous care and cultural sensitivity, provides both the championship golfer and the resort-style golfer a unique golfing adventure. The course provides 18 holes of championship golf, including the largest golf course water exhibit in the state with a cascading waterfall, an ancient cave next to the 15th tee box and an abandoned horse corral off the 17th fairway.





# How to Use a Lead Referral Service to Increase Sales and Grow Revenue

By Rachel Patterson, Marketing Assistant, 360Generators



Online lead generation services, sometimes known as online lead referral services, are on the rise in the generator world, but not everyone has heard of them. These services provide businesses with qualified, targeted sales leads from customers looking to buy or rent generators. They are often used when companies want to expand their customer base, grow their revenue, or break out into new areas of the market.

Because of the nature of the Internet, and because today's customer is looking for new and better ways to buy, online lead referral services are a source of high-quality leads. Compared to cold-calling, which typically has a close rate of 2%, leads received from a qualified lead-referral service

can result in a 10% or more close-rate for businesses.

In order to take full advantage of the leads from a lead generation service, there are two things businesses can do: choose the right lead referral service, and respond to the leads correctly.

## **Before You Sign Up: Choosing the Right Lead Referral Service**

**Quality Leads.** Leads are like sushi—quality and age matter! If a lead referral service gives businesses leads that have not been qualified, or leads that have been sitting around for days, there is a good chance that these leads will not result in a sale. Make sure the lead referral service qualifies each lead before they send it, and

that they make it a priority to send the lead out as soon as possible after receiving it.

If a lead referral services gives your business old, unqualified leads, your sales team could spend hours tracking down potential customers without making sales.

**Flexibility.** Some lead generation companies require long-term contracts in order to get their services. Think twice and sign once when it comes to these services, as a company's needs often change over time. This flexibility allows businesses to receive the right amount of leads, even as needs change.

If your business signs a service contract with a lead referral service, business needs could change, and you could be stuck with a service that is costing you money and not



providing much benefit.

**Customer Service.** We all know how frustrating it is to get an automated answering machine when all we really want is a human being to talk to. Make sure the lead referral service has an attentive staff of customer service and account managers to help with any problems that arise.

If your business doesn't receive the customer service it needs, you could be wasting money and time with a lead referral service that is all wrong for your business, with no way to fix it.

**Number of times Lead Is Sold.** Depending on the lead referral site, you could end up with leads that have been sold to only two or three other vendors, or more than five or six. And, the less a lead is sold, the better chance you have of closing it.

Before choosing a lead referral site, ask them how many times they sell their leads—it could have a significant impact on your close rate.

If a lead referral service provides a business with quality leads, great customer service, and a flexible agreement, then the business has won half the battle already.

### After You Sign Up: Making the Most of Leads

Jeff Hoogendam, a Principal of the generator lead referral service 360Generators.com, explains how to make the most of the leads you get once you sign up with a lead referral company.

**Respond Promptly.** A prompt response to a highly qualified generator lead not only tells the potential customer that your business cares about their demands and time constraints, but also that your business can handle their generator request reliably and responsibly.

"For example," Hoogendam states, "a business that receives a lead and within 15 minutes and has either put in a telephone call or an email to the potential customer has a much higher likelihood of closing the sale with them in our experience."

**Offer Incentives.** Potential customers are often price-and-deal-minded individuals who are looking for a way to get their generator solution for the best price. An incentive

can go a long way. Incentives tell a customer that you business values them enough to make the transaction worthwhile.

"And," Hoogendam adds, "an incentive doesn't have to be huge. It can be almost anything—a discount, a waived fee, a nod to convenience. Basically, whatever business owners think is appropriate."

**Provide Information.** "Provide enough information to potential customers!" Hoogendam exclaims. Potential customers need information in order to make a decision about their generator purchases. "You would be surprised how easy this can be to forget, this is one of the most common things I see." Hoogendam recommends that businesses include the following information to get the best response:

- **Price Estimate.** Even if you cannot give an exact price on the requested

Compared to cold-calling,  
which typically has a close  
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service can result in a  
10% or more close-rate  
for businesses.

generator, a price estimate or range helps the decision process of the customer, and helps the customer call you back. Don't forget to include any extra fees or costs that go along with their request.

- **Important Dates.** "Often potential customers will have a specific date, or range of dates, in mind for the delivery and installation of their generators, so let customers know immediately if your business can meet their time constraints," Hoogendam says.
- **Details About Product.** If your business has a website, include a link to it in your response. Also, make sure to include all of your contact information and your credentials and service offerings.

- **Send Leads To The Field.** "Several of our sellers have reported that at first they made the common mistake of setting up their profile to route leads to their Branch Managers, Sales Managers, or Marketing Director. However, after talking to our Account Managers here at 360Generators, they set up their profile to direct leads at the Sales Representatives in the field, and quadrupled their close rate" Hoogendam says.
- This happens because customers looking for commercial generators, residential generators, or marine generators are usually looking for price quotes in a hurry.

While Hoogendam agrees that "nothing but truly excellent service can guarantee that any sales leads will turn into sales," these tips for getting the most out of leads, and lead services, should get you the best results possible.

Lead referral services can have an immense impact on business revenue if they are used correctly. In fact, Hoogendam reports "a single lead from our service has actually paid for a year's worth of marketing costs for a couple of our vendors." Visit the "Supplier's Corner" at 360Generators.com to learn more about how lead referral services can impact your business.

### About the Author

Rachel Patterson is a Marketing Assistant for 360Generators, which delivers qualified sales leads to commercial, residential, and marine generator manufacturers and distributors interested in growing their business. The company supplies qualified leads monthly to a variety of sellers, matching them based on their specific product and geography profile. For more information, visit [www.360Generators.com](http://www.360Generators.com) or contact Stacey at 800-494-5949. ■

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**Busse, Grant.** .....(AF)  
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Business: Electrical services company specializing in generator and ups unit installations.

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Operating as Power Station** ..... (DD)  
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Phone: (905) 565-1621 Fax: (905) 565-8544  
Contact: Paul Kinkley, President  
Business: Power Station is primarily a service based company that services all generator makes and sizes. We provide our customers with planned maintenance packages and in turn through these customers supply them with generator sales, service, upgrades to their emergency systems and turn key rental generator installations. We are an authorized service partner for Thomson Technology (genset controls and transfer switches).



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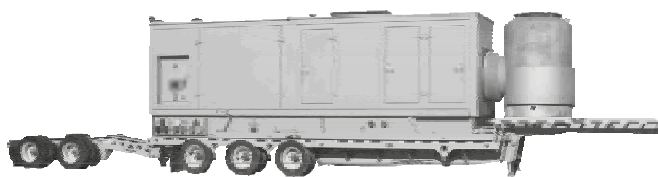
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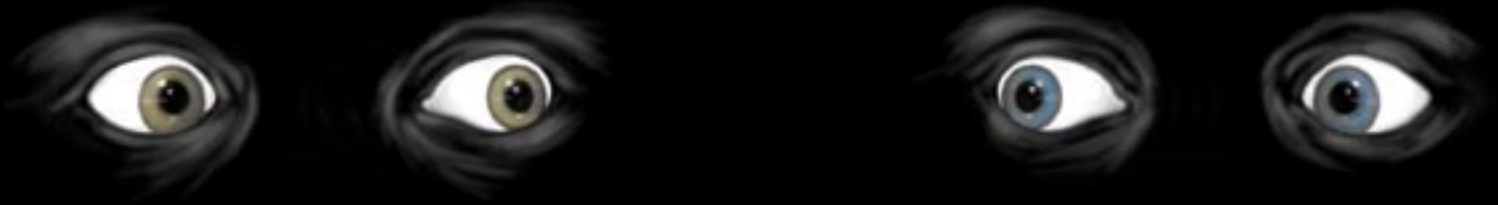
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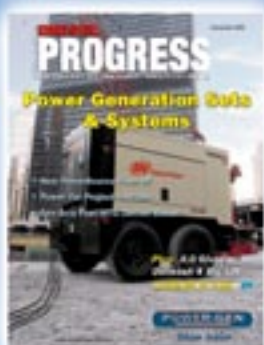
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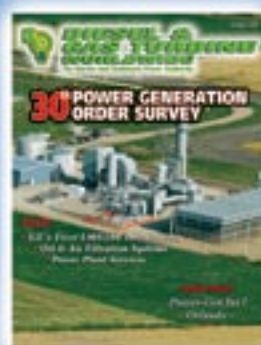


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